Changes required to both Schedule 17 and Schedule 18 of DCUSA:

18.8 Table 13 below sets out the schedule for the calculation of caps and collars for each Charging Year.

Table 13 NUF cap and collar calculation timeline

Charging Year	NUFs used create the cap and collar
2011/2012 Submission	2011/2012 NUFs
2012/2013	2011/2012 NUFs
2013/2014	2011/2012 NUFs
2014/2015	Average of 2011/2012, 2012/2013, 2013/2014 NUFs
2015/2016	Average of 2011/2012, 2012/2013, 2013/2014 NUFs
2016/2017	2016/2017 NUFs
2017/2018	2016/2017 NUFs
2018/2019	2016/2017 NUFs
2019/2020	Average of 2016/2017, 2017/2018, 2018/2019 NUFs
2020/2021	Average of 2016/2017, 2017/2018, 2018/2019 NUFs
2021/2022	Average of 2016/2017, 2017/2018, 2018/2019 NUFs
2022/2023	Average of 2019/2020, 2020/2021, 2021/2022 NUFs
2023/2024	Average of 2019/2020, 2020/2021, 2021/2022 NUFs
2024/2025	Average of 2019/2020, 2020/2021, 2021/2022 NUFs

29. DERIVATION OF 'NETWORK USE FACTORS'

Step 1:

29.1 Powerflow analysis is used to determine the change in powerflow in each Branch (in MW) that is caused by a change in load (in MW) at each node in the EHV network model, that represents either EDCM demand or CDCM demand at the EHV/HV boundary.

29.2 In essence, a change in load of X MW is applied at the node under consideration and changes in powerflow in each network Branch are identified. If the change in powerflow in a particular Branch is Y MW, as a result in the change in load at the node under consideration, then the 'Change In Branch Flow per Change In Demand' is given by:-

Abs (Y/X) (MW Branch flow per MW of demand at node)

29.3 The effects of a change in demand at each node, upon the powerflows in Branches, are evaluated for each node in turn.

29.4 The method of evaluating the 'Change in Branch Flow per Change in Demand' shall be the Incremental Method, described below:

30. INCREMENTAL METHOD:

30.1 Establish the 'base case' powerflow in each Branch using a network model constructed with demand data used to represent the Maximum Demand Scenario analysed in the marginal cost calculation, using Maximum Demand Data that represents the regulatory year that use of system charges are being calculated for.

30.2 Apply a 0.1MW (at 0.95 lagging p.f.) increment to each node, in turn, in the EHV network model (at nodes that represent either an EDCM Connectee or CDCM demand at the EHV/HV boundary) and identify the change in powerflow (in MW) in all Branches where the change exceeds both 1kVA and 0.01% of the 'base case' powerflow in the Branch. The change in Branch flow corresponding to a 0.1MW increment at a node can be evaluated by actual application of an increment to the network model, or through the use of sensitivity coefficients. Prior to the application of the increment all the transformer tap positions, distributed generation outputs and switched shunt values are fixed to the values determined in the 'base case' powerflow to prevent change in their values when analysing the power flows with the increment applied.

30.3 This calculation is performed upon the Authorised Network Model and only considers normal running arrangements.

Step 2:

30.4 The 'MW usage' of each Branch by a given nodal demand is determined by multiplying the relevant value of 'Change In Branch Flow per Change In Demand' (derived in step 1) by the demand at the node (MW) as used in the Maximum Demand Scenario for the marginal cost calculation, using the Maximum Demand Data that represents the regulatory year that use of system charges are being calculated for. This will always be a positive quantity.

Step 3:

30.5 For each Branch, the 'total MW usage' of the Branch by all nodal demands is determined by summating the 'MW usage of the Branch' by each node (as determined in step 2).

Step 4:

30.6 Each nodal demand's proportionate usage of a Branch is determined ~~as the ratio of 'MW usage' of the Branch by the nodal demand to the 'total MW usage' of the Branch. This ratio is multiplied by the annuitised MEAV of the Branch to create a £/ annum usage of the Branch by the particular node.~~using the equation below:

Alloc (£/year) = ([MW usage] / [Total MW usage]) * (Abs [Max contingency flow] / [Rating]) * AMEAV

If the branch is "generation-dominated", or (2 * Abs [Base flow load]) ≤ Abs ([Base flow] - [Base flow load]), then use:

Alloc (£/year) = ([MW usage] / [Total MW usage]) * (Abs [Max contingency flow] / [Rating]) * Abs ([Base flow load] / [Base flow]) * AMEAV

Where:

Alloc is the allocation of the AMEAV of the asset to a demand user in £/year

MW usage is the absolute value of the "MW usage" of the asset attributable to that demand user (expressed in MW)

Total MW usage is the sum of the absolute values of the “MW usage” of all demand users of that asset (expressed in MW)

Max contingency flow is the maximum post-contingent flow through the asset in MVA. The maximum post-contingency asset flows may be extracted from the ‘locational’ analyses.

Rating is the unadjusted rated capacity of the asset in MVA

Base flow load is the algebraic sum of power flows through the branch due to demand only in MW

Base flow is the aggregate power flow through the branch under normal network operation in MW

AMEAV is the annualised modern equivalent asset value in £/year of that asset

The ratio ([Max contingency flow] / [Rating]) is called the asset utilisation factor and it is capped at 1.

The quantity (Abs [Max contingency flow] / [Rating]) * Abs ([Base flow load] / [Base flow]) is called the load utilisation factor.

30.7 Sole use assets are not to be included in the calculation of the MEAV of the Branches and consequently some Branches may have an MEAV of zero.

Step 5:

30.8 For each node, the £/annum ‘usage’ of Branches (calculated in Step 4) of the same voltage level, by the demand at the node, are summated to create a total £/annum for each voltage level for the nodal demand. The considered voltage levels correspond to those used in the CDCM and include voltage levels that represent transformation between two voltages. These voltage levels are ‘132kV’, ‘132kV/EHV’, ‘EHV’, ‘EHV/HV’ and ‘132kV/HV’.

30.9 For each node where EDCM demand is present, the total £/annum ‘usage’ of Branches of each voltage level, for the node, is divided by the demand at the node (in kW), as used in the Maximum Demand Scenario, to create a £/kW/annum total usage of Branches at each voltage level by the particular node. This shall be the numerator in the network use factor, for a particular voltage level, for the EDCM demand node.

30.10 For all nodes where CDCM demand is present, and the CDCM demand is considered to be ‘dominant’ at the node (CDCM demand shall be considered to be ‘dominant’ where the DNO Party estimates that the maximum demand associated with all CDCM demand at the node exceeds the maximum demand associated with all EDCM demand at the node), the £/annum ‘usages’ of Branches at each voltage level (calculated in Step 4) are summated to create a total £/annum ‘usage’ for all CDCM dominated nodes. The CDCM demand ‘using’ each voltage level is determined by summating the nodal demands of all CDCM dominated nodes that have non zero £/annum ‘usages’ at the particular voltage level. The average £/kW/annum network usage by CDCM dominated nodes is derived for each voltage level by dividing the total £/annum usage (at the voltage level by CDCM dominated nodes) by the total CDCM demand ‘using’ the voltage level. This provides the denominators used for the network use factors.

30.11 The network use factor, at each voltage level, for each node where EDCM demand is present therefore is the £/kW/annum for the nodal demand at the appropriate voltage level, divided by the corresponding average £/kW/annum for the same voltage level determined for CDCM dominated nodes.