National Grid

CONSULTATION DOCUMENT

Modification Proposal to the Connection Charging Methodology

CCM-M-05

Implementation of Changes Required for CAP043 "Transmission Access – Entry Access Product Definition"

11 November 2002

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1. Executive Summary

This paper sets out for consultation National Grid's proposed modification to the Connection Charging Methodology to take account of the proposed CUSC Amendment CAP043: "Transmission Access – Entry Access Product Definition". This paper is published on the National Grid website at the following address:

www.nationalgrid.com/uk/indinfo/charging/mn_modifications.html

2. Introduction

National Grid is obliged under the Transmission Licence:

(i) to make revisions to the Charging Statements in order that the information set out in these statements shall continue to be accurate in all material respects;

(ii) to keep the Connection Charging Methodology at all times under review;

(iii) to make such modifications of the Connection Charging Methodology as may be requisite for the purpose of better achieving the relevant objectives, which are:

a. to facilitate effective competition in the generation and supply of electricity and (so far as is consistent therewith) to facilitate competition in the sale, distribution and purchase of electricity;

b. to result in charges which reflect, as far as reasonably practicable, the costs incurred by National Grid in its Transmission Business; and

c. to take account of the developments in National Grid's Transmission Business.

d. to facilitate competition in the carrying out of works for connection to National Grid's Transmission system.

Before making a modification to the Connection Charging Methodology, National Grid is also required by the Transmission Licence to consult with CUSC Users on the proposed modification and allow them a period of not less than 28 days within which to make written representations. The Authority can consent to a shorter consultation period.

The purpose of this document is to set out for consultation National Grid's proposal to modify the Statement of the Connection Charging Methodology to meet the Relevant Objective in Licence Condition C7A 5(c) of ensuring National Grid properly takes account of the developments in its Transmission Business.

3. Background to the Issues

As part of the ongoing industry consideration of Transmission Access arrangements, a Transmission Access Standing Group (TASG) was established by the CUSC Amendments Panel to discuss these issues and their implications for the CUSC and potential impact on other industry documents. As a result of discussions at the TASG, National Grid tabled a CUSC Amendment Proposal (CAP043) in September 2002 to introduce amendments to the CUSC and other relevant industry documents with regard to Transmission Access arrangements for the entry side of the market, with effect from 1 April 2003.

This modification paper proposes the required changes to Chapter 10 of the Statement of the Connection Charging Methodology (see Appendix 1). The CAP043 changes introduce a new capacity definition for generation which it is proposed to use for the connection asset allocation procedure.

4. Explanation of the Issues

The change to the Connection Charging Methodology is required to take into account the new definition for "Connection Entry Capacity" (CEC), proposed by CAP043. Currently, the allocation rules for connection assets use a Generator's capacity to allocate the connection assets to that User at a connection site. Under the new proposals, National Grid would use a Generator's CEC for allocation purposes and this needs to be made explicit in the Connection Charging Methodology.

5. Proposed Modifications

Description of proposed modification

As a result of the CAP043 proposal for the definition of Connection Entry Capacity (CEC) as part of the "Transmission Access – Definition" it is proposed to modify the Connection Charging Methodology to use a Generator's CEC for connection asset allocation purposes.

Justification for proposed modification

To better meet the Relevant Objective in Licence Condition C7A 5(c) of ensuring National Grid properly takes account of the developments in its Transmission Business.

Proposed Changes to the Statement of the Connection Charging Methodology

It is proposed that Chapter 10 of the Statement of the Connection Charging Methodology is modified as indicated in Appendix 1 in order to use a Generator's Connection Entry Capacity for connection asset allocation purposes.

Suggested alternatives

None.

Implementation date

1 April 2003.

Indicative Impact on Connection Charges

If the Connection Entry Capacity for a generator differs from the capacity currently used to calculate the generator's allocations, there may be an impact on the allocation of the connection assets at the connection site, and therefore an impact on Connection Charges of the Users at the connection site.

The impact on Connection Charges will be assessed as part of the process of establishing the Connection Entry Capacity.

Impacts on Other Industry Documents

There is no impact on other industry documents.

6. Responses to this Consultation

Comments and views are invited on all the issues raised in this consultation document. In order that your comments and views are considered as part of National Grid's report to the Authority, responses must be received by **9 December 2002**. If you wish to provide comments on this proposed modification, responses are welcome via e-mail to: Stuart.Easterbrook@uk.ngrid.com.

Alternatively, written comments may be addressed to:

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Appendix 1 – Proposed Changes to Chapter 10: The Connection Asset Allocation Process

General Allocation Principles

10.6 The following points are general to the allocation process and should be applied to all connection sites.

10.7 When undertaking an allocation, the connection asset requirements of each User are placed in the left-hand column of the allocation matrix and the remaining requirements emanate from there. This is the so-called left-hand rule. An example of this principle and its application can be found as **Annex 10A** of this allocation guide.

10.8 If connection assets have been installed or retained for a User's specific requirements or specialist need, then those connection assets will be allocated completely to that User. The allocation of the extra connection assets to Users in this way will take precedence over the normal allocation principles. These extra connection assets are then excluded from the normal allocation of such assets to other Users at the site.

10.9 The process starts from the Ownership Boundary on the Lower Voltage (LV) side of the substation and works up to the 400kV or 275kV feeder or Main Transmission Incomer (MTI) bays.

10.10 Banked transformers will require allocation of bus coupler/section bays in accordance with the number of High Voltage (HV) bays seen from the HV busbars.

10.11 The treatment of nominally over-equipped connection sites is described in **Annex 10B**.

10.12 The actual allocation of Bus Coupler/Section bays will depend on the individual connection arrangement and size of the generating unit.

10.13 Where connection sites are equipped with reserve bar disconnectors and cross over connections, the allocation will follow the Bus Coupler/Section bay allocation.

10.14 Allocations are not generally made to specific connection assets but are apportioned across all connection assets of the same type. Exceptions include connection assets that are designated as Generation Only Spurs, connection assets that are installed for specific use or allocations that are in line with paragraph 10.25.

10.15 For the purposes of allocating connection assets Interconnectors are treated as generation connections.

Identification of Bussing Points

10.16 At certain sites a share of the connection assets will be apportioned to the TNUoS charging category and connection charges to the connection User(s) at the connection site will be correspondingly reduced. These connection sites are known as Bussing Points.

10.17 A Bussing Point is a substation which has connected to it more than four 400kV/275kV circuits which are not connection assets or are not considered as Generation only Spurs. Generation only Spurs are described in more detail in **Chapter 1 subsection Generation Only Spurs**. Where there is a Bussing Point, the adjustment is calculated by apportioning a share of circuit terminating switchgear and a share of all bus sections and bus couplers at the connection site to TNUoS, normally as calculated by the Left Hand Rule.

Generation Only Spurs

10.18 A Generation Only Spur including the associated terminating switchgear will be shared in equal proportions by all generators located at the connection site where the spur begins. TNUoS charges will be allocated a share of the spur circuit (including terminating switchgear). In the case of multiple spurs allocated to connection, TNUoS charges will be allocated an equal share of only the lowest cost spur circuit, including terminating switchgear. The lowest cost circuit is identified with reference to the associated Net Asset Values excluding the switchgear.

10.19 The Main Transmission Incomer (excluding those that are part of Generation Only Spur circuits), Bus Coupler and Bus Section Bays at the substation at the system end of a Generation Only Spur will be allocated to the generators sharing the Generation Only Spur circuit. The allocation of these MTI bays will be based on the ~~capacity~~ **Connection Entry Capacity** of the generation. The allocation of the Bus Coupler and Bus Section Bays will be based on the number of Generation Only Spur circuits connected.

Appendix 1 continued – Proposed Changes to Chapter 10: The Connection Asset Allocation Process

Allocation of supergrid transformers (SGTs)

Capacity Requirements

10.23 The allocation to Users of transformers where one side is run at a Transmission Voltage and the other side is run at a Distribution Voltage is usually straightforward. The requirement of each User is deemed to be that their ~~capacity~~ **Connection Entry Capacity or demand capacity** can always be met immediately with any one transformer on outage, based on nameplate ratings **of the SGTs**. This ~~capacity~~ **Connection Entry Capacity or demand capacity** requirement dictates the number of SGTs allocated.

10.24 The allocation of the connection bays, cables etc. associated with transformer circuits follows the allocation of the SGT, except in the case of banked transformers.

10.25 If a User is connected to National Grid at a 132kV or lower voltage substation (except where this substation is subject to a Rental Agreement) which is:

- within the control of National Grid,
- shared with other Users, and
- the User has a demand of less than 25 MW,

then only two SGTs and associated circuits will be assigned to the connection of that User. The SGTs and associated circuits which are so assigned to connection will be the two newest SGTs which were commissioned before 30 March 1990 or Pre-Vesting. Furthermore, if the transformers are of different ratings then the transformers with the lowest ratings are chosen. If there are fewer than two pre-Vesting transformers installed at the connection site the allocation shall be made to any pre-Vesting units and the transformer(s) installed closest to 30 March 1990. This principle is modified only in the case of banked transformers.

Banked Transformers

10.26 ~~The capacity requirements of banked transformers will follow the principles outlined above~~. **The allocation of banked transformers will follow the capacity requirements outlined above.** The allocation of the banking connections and the associated switchgear will follow the same apportionment applied to the transformers. The allocation of banking connections will also apply where transformers have been apportioned as in paragraph 10.24. In this case the allocation of HV transformer switchgear and circuitry will only be made to those circuits associated with the transformers which have been allocated under paragraph 10.24.

10.27 Where paragraph 10.24 would imply that two transformers within the same bank are to be allocated to the User, this will not happen. The next oldest transformer at the connection site will be allocated.

Appendix 1 continued – Proposed Changes to Chapter 10: The Connection Asset Allocation Process

Allocation of Feeders for Main Transmission Incomer (MTI) Bays

10.32 The tables below detail the allocation of the Main Transmission Incomer bays.

Generation

~~Capacity Connected~~ Connection Entry Capacity	Connection Voltage	Spur Lines and Terminating Switchgear
=1320MW	400kV	2
>1320MW	400kV	4
=1000MW	275kV	2
>1000MW	275kV	4

10.33 However, a generating station having both an Entry and an Exit Agreement connected to the same bar is apportioned on the basis of whichever requirement is the greater. In most instances, this is the Entry Agreement. Where the two requirements are the same the Entry requirement will be used.

Appendix 1 continued – Proposed Changes to Chapter 10: The Connection Asset Allocation Process

Allocation of Mesh Sub-stations

Allocation of Mesh Bays

10.38 Where generation or demand is connected to a mesh substation the User shall be allocated Mesh Bays (and Mesh Line Disconnectors) in accordance with the Connection **Entry** Capacity or the number of corners to which the Users is connected (Corners Connected, as detailed below) which ever is the greater.

Connection Capacity

Generation

Connection Entry Capacity ~~connected~~	**Voltage**	**Mesh Bays**	**Mesh Line Disconnectors**
=1320MW	400kV	3	2
>1320MW	400kV	4	4
=1000MW	275kV	3	2
>1000MW	275kV	4	4

Demand

Capacity Connected	**Mesh Bays**	**Mesh Line Disconnectors**
=300MW	3	2
>300MW	4	4

Corners Connected

Number of Connected Corners	**Mesh Bays**
1	2
2	3
3	4
4	4

Appendix 1 continued – Proposed Changes to Chapter 10: The Connection Asset Allocation Process

Annex 10B: Nominally Over Equipped Connection Sites

B.1 This appendix outlines four basic examples of ways in which a connection site can be considered as having connection assets which exceed the strict, theoretical needs of the individual Users at the connection site. These can be described as:-

Historical

B.2 This is where the connection assets at the connection site were installed to meet a requirement of the Users for connection capacity which no longer exists. An example would be where a User, at one time, had a requirement for, say, 270 MW. This would allocate three 240 MVA 400/132kV transformers to the User. Due to reconfiguration of that User's network only 200 MW is now required from the connection site. The lower requirement would only allocate two transformers, but all the transformers are kept in service. The connection assets will continue to be assigned to the User's connection, and charged for as connection, until the User makes a Modification Application to reduce the historical requirement. In some cases the Modified requirement will mean that Termination Payments will have to be made on some connection assets.

Combined

B.3 This is where two or more Users share a connection site and it is the combined requirement from all Users at the connection site upon which the allocation is applied. An example is where two generators each with a ~~Installed~~ **Connection Entry** Capacity of 1000MW are connected to a connection site. Either generator, on its own, would only require two circuits. However combined they would require four.

B.4 The combined requirement of all Users at a connection site may mean that more connection assets of a particular type have to be installed than the requirement of any individual User. If this is the case, the Users' requirements are to be allocated across all connection assets of the same type. For example, if a connection site has three Users connected, Users A, B and C, with requirements for a particular type of connection asset of 1, 2 and 2 respectively as read from the appropriate table. There are 4 of these bays at the particular site. The allocation would be:

	1	2	3	4	Allocation
A[1]	$^1/_3$	-	-	-	= $^1/_3$ / 2 = 0.167 of all the bays
B[2]	$^1/_3$	$^1/_2$	-	-	= ($^1/_3$+$^1/_2$) / 2 = 0.416 of all the bays
C[2]	$^1/_3$	$^1/_2$	-	-	= ($^1/_3$ +$^1/_2$) / 2 = 0.416 of all the bays

B.5 As another example, if a connection site had four feeder connections but no individual User has a requirement for all the connection assets, the allocation is continued across all connection assets. If User 'A' has a **Connection Entry Capacity** ~~capacity~~ of 800 MW, User 'B' a ~~capacity~~ **CEC** of 1000MW and User 'C' a ~~capacity~~ **CEC** of 500 MW of generation each, then according to paragraph 10.32 they would be allocated a two circuit connection for each. The total capacity would, however, mean that four circuits are actually built. The allocation would be as follows:

	1	2	3	4	Allocation
A[2]	$^1/_3$	$^1/_3$	-	-	= ($^1/_3$ +$^1/_3$) / 2 = 0.333 of all 4 of the bays
B[2]	$^1/_3$	$^1/_3$	-	-	= ($^1/_3$ +$^1/_3$) / 2 = 0.333 of all 4 of the bays
C[2]	$^1/_3$	$^1/_3$	-	-	= ($^1/_3$+$^1/_3$) / 2 = 0.333 of all 4 of the bays

B.6 Thus all Users will pay one third of the charges for each of the four feeder bays (MTI).

Early Construction

B.7 The party causing the early construction will be allocated all those assets until the normal allocation process can be applied as follows.

B.8 An example of early construction is where connection assets are installed by National Grid for the connection of a second User ahead of the required date. If the connection assets are installed at the time of the connection of a first User, they will not be allocated to the first User until the second User is connected. An exception is where the construction of these connection assets is requested by the first User and in such cases the connection assets would form part of the Connection Agreement.

B.9 If a User has a multi-phase project, it may be necessary to install connection assets for the latter phases at the time of the first phase. These connection assets could be charged from the first phase charging date.

Connection site Specific Technical or Economic Conditions

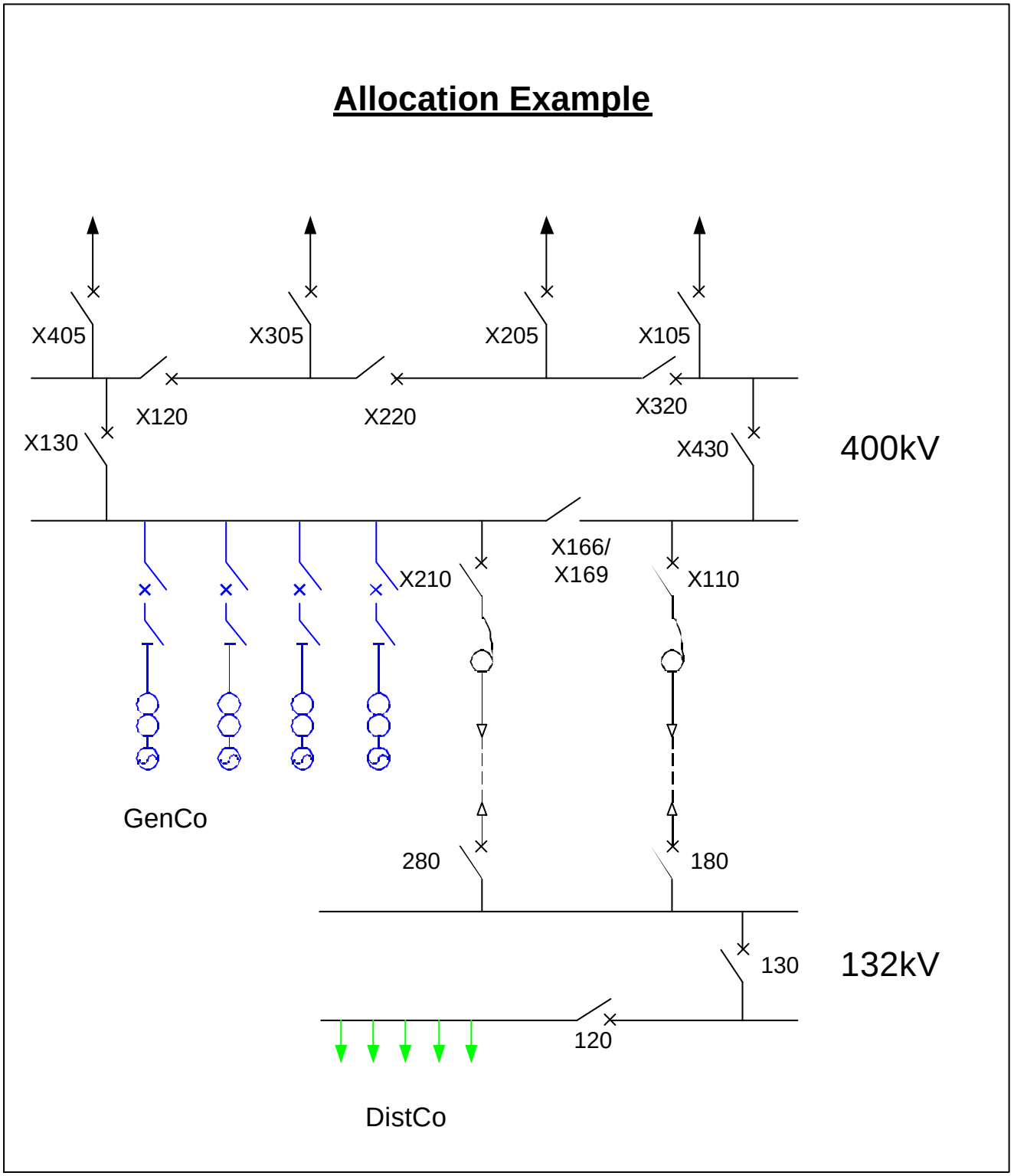
B.10 In circumstances where National Grid has identified a wider requirement for development of the transmission system, it may elect to install connection assets of greater size and capacity than the practicable minimum scheme required for a particular connection. In these circumstances, however, connection charges for the party seeking connection will normally be based on the level of connection assets consistent with the practicable minimum scheme needed to meet the applicant's requirements.

B.11 There may be cases where there are specific conditions where the practicable minimum scheme at a site has to be greater than the strict,

theoretical interpretation of the standards. In these cases all units will still be assigned to connection and connection charges levied.

B.12 A practicable minimum scheme is considered in terms of the system as a whole and may include a change in voltage level.

Annex 10C: Typical Allocation Example



Users GenCo: A Generator with 4 Generating Units @ 500MW **each (CEC of 2000MW)**
DistCo: A Distribution Company with a demand of 220MW on 5 outgoing circuits

Asset Details

132kV Assets	120 Bus Section Bay 130 Bus Section Bay 180 Double Busbar Bay 280 Double Busbar Bay SGT1 132kV Cable 200m SGT2 132kV Cable 200m
SGTs at 400kV	SGT1 400/132kV 240MVA SGT2 400/132kV 240MVA
400kV Assets	X120 Bus Section Bay X220 Bus Section Bay X320 Bus Section Bay X130 Bus Coupler Bay X430 Bus Coupler Bay X166/X169 Reserve Busbar Bay X110 Double Busbar Bay X210 Double Busbar Bay X105 Double Busbar Bay X205 Double Busbar Bay X305 Double Busbar Bay X405 Double Busbar Bay

Allocations:

The allocation begins with the lowest voltage assets.

132kV Bus Couplers and sections (120,130)

The DistCo has 5 outgoing LV feeders and therefore from the allocation guide requires 4 bus couplers and sections.

The site has 2 bus couplers and sections hence is under endowed in relation to the generic rules.

Bus Coupler/ Section	1	2	
DistCo	1	1	2/1 of 2 = 100% to DistCo

400/132kV 240MVA SGTs and associated circuitry

Demand = 220MW SGT1 = 240MVA
SGT2 = 240MVA Total = 480MVA = MW assuming unity power factor

The first SGT meets the demand and the second SGT covers the requirement to meet demand under the loss of one transformer. Hence both SGTs are allocated

100% to distribution. The associated SGT circuitry (180, 280, SGT cables and X110, X210) follow the allocation of the SGTs, I.e. 100% to the distribution company.

400kV Bus Couplers and Sections (X120, X220, X320, X130, X430)

DistCo has 2 outgoing SGT feeders deemed allocated and therefore requires 1 bus coupler/section.

GenCo has 4 connected generating units and therefore requires 5 bus couplers/sections. Applying left-hand rule:

Bus Coupler/Section	1	2	3	4	5	
DistCo	1/2					1/2 of 5 = 10% to DistCo
GenCo	1/2	1	1	1	1	9/2 of 5 = 90% to GenCo

The X166/X169 Reserve Busbar Bay follows the allocation of the main bus coupler and section bays. Note it does not feature in the calculation of the allocation.

The DistCo therefore takes an allocation of 10% of (X120, X220, X320, X130, X430 and X166/X169) and the GenCo 90% of all these assets.

400kV Main Transmission Infeeds (X105, X202, X305, X405)

DistCo has less than 300MW of demand and therefore requires 2 MTIs.
Generator has **a Connection Entry Capacity of** more than 1320MW ~~of generation~~ and therefore requires 4 MTIs.

The site has 4 MTIs.

Bus Coupler/Section	1	2	3	4	
DistCo	1/2	1/2			2/2 of 4 = 25% to DistCo
GenCo	1/2	1/2	1	1	6/2 of 4 = 75% to Generator

The DistCo therefore takes an allocation of 25% of all four MTIs and the GenCo 75% of all four MTIs.

Appendix 2 – Proposed Definition of Connection Entry Capacity (CEC)

Glossary

Connection Entry Capacity (CEC) As defined in the Connection and Use of System Code