

Single Electricity Market

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| Final REcommendation Report  Mod\_21\_19 loss adjustment factor application for interconnectors  20 december 2019 |

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Document History

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| --- | --- | --- | --- |
| **Version** | **Date** | **Author** | **Comment** |
| 1.0 | 20 Dec 2019 | Modifications Committee Secretariat | Issued to Modifications Committee for review and approval |
| 2.0 |  | Modifications Committee Secretariat | Issued to Regulatory Authorities for final decision |

Reference Documents

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| --- |
| **Document Name** |
| [Trading and Settlement Code](https://www.sem-o.com/rules-and-modifications/balancing-market-modifications/market-rules/TSC-Part-B.docx) |
| [Modification Proposal Form](https://www.sem-o.com/documents/market-modifications/Mod_21_19/Mod_21_19-LossAdjustmentFactorApplicationforInterconnectors.docx) |
| [Presentation](https://www.sem-o.com/documents/market-modifications/Mod_21_19/Mod_21_19PresentationLossfactorApplicationforInterconnectors051219(2).pdf) |
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# MODIFICATIONS COMMITTEE RECOMMENDATION

## Recommended for approval– unanimous Vote

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| --- | --- | --- |
| **Recommended for Approval by Unanimous Vote** | | |
| Rochelle Broderick | Supplier Alternate | Approve |
| Kevin Hannafin | Generator Member | Approve |
| Siobhain O’Neill | Assetless Alternate | Approve |
| Ian Mullins | Supplier Alternate | Approve |
| Sinead O’Hare | Generator Member | Approve |
| Jim Wynne | Supplier Member | Approve |
| Robert McCarthy | DSU Alternate | Approve |
| Cormac Daly | Generator Member | Approve |
| Andrew Burke | Supplier Member | Approve |
| Paraic Higgins (Chair) | Generator Member | Approve |

# Background

This Modification Proposal was raised by SEMO and was received by the Secretariat on the 12th November 2019. The Modification Proposal was raised and voted on at Meeting 95 on 5th December 2019.

For any values in MW or MWh for an Interconnector, positive values relate to imports to the Pool and negative values relate to exports from the Pool.

TSC F.4.3.3 currently contains a distinct rule for the application of Combined Loss Adjustment Factors (CLAF) for Interconnector Units. When the quantity required to be loss-adjusted is ≥ 0 (interconnector is importing), the variable before application of losses is multiplied by the CLAF. When the quantity to be loss-adjusted is negative for (i.e. exporting); the variable before application of losses is divided by is the CLAF.

During development of a system change request to correct omitted provisions in relation to system application of F.4.3.3, SEMO has considered all aspects of the treatment of losses for Interconnectors and has identified four distinct requirements for Code Change:

* Application of losses to Accepted Offer Quantity (QAO) and Accepted Bid Quantity (QAB) for Interconnector Units
* Application of losses to the Capacity Quantity (qC) for Interconnector Units
* Application of losses otherwise
* Housekeeping changes

**Application of losses to Accepted Offer Quantity (QAO) and Accepted Bid Quantity (QAB) for Interconnector Units**

Bid Offer Acceptances (BOAs) are the actions taken by the TSOs in the Balancing Market, to dispatch a unit away from its Final Physical Notification (FPN). The calculation for Interconnectors is not as per F.6.2 but instead the System Operator submits those QAB/QAO values under TSC F.2.4.8 as SO trades.

Interconnector QAB/QAO are based on the Connection Point (i.e. the remote end in GB) and therefore need to have losses applied to translate to the I-SEM side for settlement.

Current settlement algebra does not correctly apply loss factors; as QAO/QAB quantities (the SO trades) may have a direction which is actually a reduction in the overall flow in the opposite direction. For example, where there are negative SO trades being used by the TSO to reduce the overall import (positive) flow on the Interconnector. The predominant direction of flow must be considered, represented by the Dispatch Quantity (QD) for the Interconnector.

If QD>=0 then the interconnector is importing, QAO and QAB should be multiplied by CLAF and where QD<0 (exporting) QAB and QAB should be divided by CLAF.

Whereas applying the current logic only the direction of the trade itself is considered when determining whether to multiply or divide by CLAF.

**Application of losses to the Capacity Quantity (qC) for Interconnector Units**

Capacity Quantity (qC) for Interconnectors is based on the Connection Point (i.e. the remote end in GB) and therefore needs to have losses applied to translate to the I-SEM side for settlement. However, loss factor application should always be a multiplication by qC, as qC always reflects an import (i.e. capacity provided to the I-SEM).

Capacity performance for an Interconnector is measured against the derated capacity, based on Interconnector availability, not the actual flow. For Interconnectors, derated capacity is always representing an import (irrespective of the sign). As a result, negative quantities (such as secondary trading to remove exposure to capacity performance measures) represent a reduction in import and should therefore have the import loss factor applied. In order to apply the correct losses to qC for Interconnectors, the calculation should always be based on qC multiplied by CLAF.

Whereas the current treatment considers the signage of the qC volume and therefore divides where this is negative in error.

**Application of losses otherwise**

Interconnector Reference Programme data (ICRP is used for provision of the FPN and qD to the MO) and the Metered Quantity (QM) are based on the Connection Point (i.e. the remote end in GB) and therefore need to have losses applied to translate to the I-SEM side for settlement. Current settlement algebra correctly multiplies by the loss factor when importing. For all Interconnector quantities that are not QAO, QAB or qC, the quantities relate to a single value related to the direction of “flow” on an Interconnector and therefore evaluate correctly under current logic.

For example, Metered Quantity (QM) related to the meter value at the remote (GB) end of the Interconnector and therefore losses can be applied so that positive quantities are multiplied by the CLAF and negative quantities are divided by the CLAF. TSC F.4.3.3 addresses this correctly but wording is required to state that this should exclude the application of losses to the items set out above; qC and QAO/QAB for interconnectors.

**Housekeeping changes**

Clarification in F.4.3.2 of application to Capacity Market Units (except in the case of a CMU related to an Interconnector).

Clarification in F.4.3.3 of application to an Interconnector and Capacity Market Units related to an Interconnector (except for qC and QAB/QAO).

**Summary**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Loss-Adjusted Variable to be determined** | **Treatment** | **Change** |
| F.4.3.2 | Relates to a Generator (excludes IEU,IRCU) a Capacity Market Unit (excluding CMU related to IC ) and Supplier Unit | Variable \* FCLAF | to include CMU which wasn’t specified previously |
| F.4.3.3 | Relates to IC, IEU IRCU or a CMU related to IC, (excluding qC and QAB/QAO) | If Variable ≥ 0 then \*FCLAF, else /FCLAF | to exclude qC and QAB/QAO which are now covered by F.4.3.4 and F.4.3.5 |
| F.4.3.4 | QAB and QAO related to an IRCU | If QD ≥0 then \* FCLAF else /FCLAF | test against QD instead of direction of variable previously covered in F.4.3.3 |
| F.4.3.5 | qC which relates to a CMU related to an Interconnector | qC\* FCLAF | always multiply rather than test direction of variable previously covered in F.4.3.3 |

# PURPOSE OF PROPOSED MODIFICATION

**3A.) justification of Modification**

This Modification has been raised to address two issues in Settlement algebra applying Loss Factors to Interconnector variables:

1. QAB/QAO are based on the Connection Point (i.e. the remote end in GB) and therefore need to have losses applied to translate to the I-SEM side for settlement.

Current settlement algebra does not correctly apply loss factors, as QAO/QAB quantities (SO trades) may have a direction but is actually a reduction in the overall flow in the opposite direction. For example, where there are negative SO trades being used by the TSO to reduce the overall import (positive) flow on the Interconnector.

1. qC for Interconnectors is based on the Connection Point (i.e. the remote end in GB) and therefore needs to have losses applied to translate to the I-SEM side for settlement.

However, loss factor application should always be a multiplication by qC, as qC always reflects an import (i.e. capacity provided to the I-SEM). Current settlement algebra does not address this.

**3B.) Impact of not Implementing a Solution**

If this Modification is not implemented Settlement algebra to incorrectly address loss factor application to Interconnectors (QAB/QAB and qC).

**3c.) Impact on Code Objectiv****es**

~~(c)(~~e) to ensure no undue discrimination between persons who are parties to the Code;

By correcting the error in the current drafting of Interconnector Loss factor application, Interconnector units will be settled according to the intention of the market design and Settlement algebra will apply loss factors fairly to Interconnector variables qC and QAO/QAB by giving consideration to whether the unit is importing or exporting.

# Working Group and/or Consultation

N/A

# impact on systems and resources

Impact Assessment required for system impacts.

# Impact on other Codes/Documents

N/A

# MODIFICATION COMMITTEE VIEWS

## Meeting **95 – 5 December 2019**

The Proposer delivered a [presentation](https://www.sem-o.com/documents/market-modifications/Mod_21_19/Mod_21_19PresentationLossfactorApplicationforInterconnectors051219(2).pdf) on the Modification Proposal and also a background to it. The Proposer went through the slides highlighting that the current issue was the focus on the direction of the variable rather that the flow of the interconnector. So the change will be to look at the Dispatch Quantities to correct this. A summary was provided stating that sections that have been modified will require a system change but this is expected to be of medium to low impact. It was queried whether the new variable qCLF was defined and the response was this variable already exists as qC and the Code already covers definitions of variable when the Loss Factors are applied therefore there is no requirement for duplication.

# Proposed Legal Drafting

As set out in Appendix 1.

# LEGAL REVIEW

N/A

# IMPLEMENTATION TIMESCALE

It is proposed that this Modification Proposal is implemented as the Modifications Committee have Recommended it for Approval. This Modification requires system changes and as such it is recommended that it is made effective from the first Settlement Day following delivery of the associated system changes.

# Appendix 1: Mod\_21\_19 loss adjustment factor application for interconnectors

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| **MODIFICATION PROPOSAL FORM** | | | | | |
| **Proposer**  *(Company)* | **Date of receipt**  *(assigned by Secretariat)* | | **Type of Proposal**  *(delete as appropriate)* | | **Modification Proposal ID**  *(assigned by Secretariat)* |
| **SEMO** | **12 November 2019** | | **Standard** | | **Mod\_21\_19** |
| **Contact Details for Modification Proposal Originator** | | | | | |
| **Name** | | **Telephone number** | | **Email address** | |
| **Lauren Skillen-Baine** | |  | | **Laurenskillen.baine@soni.ltd.uk** | |
| **Modification Proposal Title** | | | | | |
| **Loss Adjustment Factor Application for Interconnectors** | | | | | |
| **Documents affected**  *(delete as appropriate)* | | **Section(s) Affected** | | **Version number of T&SC or AP used in Drafting** | |
| **T&SC Part B** | | **F.4.3.3** | | **V21** | |
| **Explanation of Proposed Change**  *(mandatory by originator)* | | | | | |
| For any values in MW or MWh for an Interconnector, positive values relate to imports to the Pool and negative values relate to exports from the Pool.  TSC F.4.3.3 currently contains a distinct rule for the application of Combined Loss Adjustment Factors (CLAF) for Interconnector Units. When the quantity required to be loss-adjusted is ≥ 0 (interconnector is importing), the variable before application of losses is multiplied by the CLAF. When the quantity to be loss-adjusted is negative for (i.e. exporting); the variable before application of losses is divided by is the CLAF.  During development of a system change request to correct omitted provisions in relation to system application of F.4.3.3, SEMO has considered all aspects of the treatment of losses for Interconnectors and has identified four distinct requirements for Code Change:   * Application of losses to Accepted Offer Quantity (QAO) and Accepted Bid Quantity (QAB) for Interconnector Units * Application of losses to the Capacity Quantity (qC) for Interconnector Units * Application of losses otherwise * Housekeeping changes   **Application of losses to Accepted Offer Quantity (QAO) and Accepted Bid Quantity (QAB) for Interconnector Units**  Bid Offer Acceptances (BOAs) are the actions taken by the TSOs in the Balancing Market, to dispatch a unit away from its Final Physical Notification (FPN). The calculation for Interconnectors is not as per F.6.2 but instead the System Operator submits those QAB/QAO values under TSC F.2.4.8 as SO trades.  Interconnector QAB/QAO are based on the Connection Point (i.e. the remote end in GB) and therefore need to have losses applied to translate to the I-SEM side for settlement.  Current settlement algebra does not correctly apply loss factors; as QAO/QAB quantities (the SO trades) may have a direction which is actually a reduction in the overall flow in the opposite direction. For example, where there are negative SO trades being used by the TSO to reduce the overall import (positive) flow on the Interconnector. The predominant direction of flow must be considered, represented by the Dispatch Quantity (QD) for the Interconnector.  If QD>=0 then the interconnector is importing, QAO and QAB should be multiplied by CLAF and where QD<0 (exporting) QAB and QAB should be divided by CLAF.  Whereas applying the current logic only the direction of the trade itself is considered when determining whether to multiply or divide by CLAF.  **Application of losses to the Capacity Quantity (qC) for Interconnector Units**  Capacity Quantity (qC) for Interconnectors is based on the Connection Point (i.e. the remote end in GB) and therefore needs to have losses applied to translate to the I-SEM side for settlement. However, loss factor application should always be a multiplication by qC, as qC always reflects an import (i.e. capacity provided to the I-SEM). Capacity performance for an Interconnector is measured against the derated capacity, based on Interconnector availability, not the actual flow. For Interconnectors, derated capacity is always representing an import (irrespective of the sign). As a result, negative quantities (such as secondary trading to remove exposure to capacity performance measures) represent a reduction in import and should therefore have the import loss factor applied. In order to apply the correct losses to qC for Interconnectors, the calculation should always be based on qC multiplied by CLAF. Whereas the current treatment considers the signage of the qC volume and therefore divides where this is negative in error.  Application of losses otherwise  Interconnector Reference Programme data (ICRP is used for provision of the FPN and qD to the MO) and the Metered Quantity (QM) are based on the Connection Point (i.e. the remote end in GB) and therefore need to have losses applied to translate to the I-SEM side for settlement. Current settlement algebra correctly multiplies by the loss factor when importing. For all Interconnector quantities that are not QAO, QAB or qC, the quantities relate to a single value related to the direction of “flow” on an Interconnector and therefore evaluate correctly under current logic. For example, Metered Quantity (QM) related to the meter value at the remote (GB) end of the Interconnector and therefore losses can be applied so that positive quantities are multiplied by the CLAF and negative quantities are divided by the CLAF. TSC F.4.3.3 addresses this correctly but wording is required to state that this should exclude the application of losses to the items set out above; qC and QAO/QAB for interconnectors.  **Housekeeping changes**  Clarification in F.4.3.2 of application to Capacity Market Units (except in the case of a CMU related to an Interconnector).  Clarification in F.4.3.3 of application to an Interconnector and Capacity Market Units related to an Interconnector (except for qC and QAB/QAO).  **Summary**   |  |  |  |  | | --- | --- | --- | --- | | **Section** | **Loss-Adjusted Variable to be determined** | **Treatment** | **Change** | | F.4.3.2 | Relates to a Generator (excludes IEU,IRCU) a Capacity Market Unit (excluding CMU related to IC ) and Supplier Unit | Variable \* FCLAF | to include CMU which wasn’t specified previously | | F.4.3.3 | Relates to IC, IEU IRCU or a CMU related to IC, (excluding qC and QAB/QAO) | If Variable ≥ 0 then \*FCLAF, else /FCLAF | to exclude qC and QAB/QAO which are now covered by F.4.3.4 and F.4.3.5 | | F.4.3.4 | QAB and QAO related to an IRCU | If QD ≥0 then \* FCLAF else /FCLAF | test against QD instead of direction of variable previously covered in F.4.3.3 | | F.4.3.5 | qC which relates to a CMU related to an Interconnector | qC\* FCLAF | always multiply rather than test direction of variable previously covered in F.4.3.3 | | | | | | |
| **Legal Drafting Change**  *(Clearly show proposed code change using* ***tracked*** *changes, if proposer fails to identify changes, please indicate best estimate of potential changes)* | | | | | |
| 6. 4. 3. 1. Where the Market Operator is required to calculate or determine a Loss-Adjusted variable which relates to a Generator Unit, u, other than an Interconnector Error Unit or an Interconnector Residual Capacity Unit, a Capacity Market Unit (except in the case of a Capacity Market Unit related to an Interconnector where Loss-Adjusted variables are calculated as set out in F.4.3.3 and F.4.3.5) and each Supplier Unit, v, in respect of an Imbalance Settlement Period, γ, and where XXXγ is the variable before the application of Transmission Losses and Distribution Losses, it shall apply the following calculation:   where:   * + - * 1. XXXLFγ is the relevant Loss-Adjusted variable to be determined; and         2. FCLAFγ is the Combined Loss Adjustment Factor for Generator Unit, u, or Supplier Unit, v, in Imbalance Settlement Period, γ, determined under section F.4.2.   F.4.3.3 Where the Market Operator is required to calculate a Loss-Adjusted variable which relates to an Interconnector, Interconnector Error Unit, Interconnector Residual Capacity Unit or a Capacity Market Unit related to an Interconnector, (except in the case of the variables set out under F.4.3.4 and F.4.3.5), in respect of an Imbalance Settlement Period, γ, and where XXXuγ is the variable before application of Transmission Losses and Distribution Losses, it shall apply the following calculation:  where:   1. XXXLFuγ is the relevant Loss-Adjusted variable to be determined; and 2. FCLAFlγ is the Combined Loss Adjustment Factor for the relevant Interconnector, l, in Imbalance Settlement Period, γ, determined under section F.4.2   F.4.3.4 Where the Market Operator is required to calculate or determine Loss Adjusted variables QABLF and QAOLF in accordance with F.2.4.8 which relate to an Interconnector Residual Capacity Unit, in respect of an Imbalance Settlement Period, γ, and where QABuγ and QAOuγ is the variable before application of Transmission Losses and Distribution Losses, it shall apply the following calculation:  *where:*   * + - * 1. *QDlγ is the Dispatch Quantity for the Interconnector, l, in Imbalance Settlement Period, γ*         2. *QAOLFuoiγ is the Loss-Adjusted Accepted Offer Quantity for Interconnector Residual Capacity Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ; and*         3. *QABLFuoiγ is the Loss-Adjusted Accepted Bid Quantity for Interconnector Residual Capacity Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ.*         4. *FCLAFlγ is the Combined Loss Adjustment Factor for the relevant Interconnector, l, in Imbalance Settlement Period, γ, determined under section F.4.2*   F.4.3.5 Where the Market Operator is required to calculate Loss Adjusted variable qCLF which relates to a Capacity Market Unit related to an Interconnector, in respect of an Imbalance Settlement Period, γ, and where qCuγ is the variable before application of Transmission Losses and Distribution Losses, it shall apply the following calculation:  where:   1. qCLFΩn is the Loss-Adjusted Capacity Quantity to be determined 2. is the Capacity Quantity for Capacity Market Unit, Ω, for Contract Register Entry, n, determined in accordance with the Capacity Market Code; 3. FCLAFlγ is the Combined Loss Adjustment Factor for the relevant Interconnector, l, in Imbalance Settlement Period, γ, determined under section F.4.2 | | | | | |
| **Modification Proposal Justification**  *(Clearly state the reason for the Modification)* | | | | | |
| This Modification has been raised to address two issues in Settlement algebra applying Loss Factors to Interconnector variables:   1. QAB/QAO are based on the Connection Point (i.e. the remote end in GB) and therefore need to have losses applied to translate to the I-SEM side for settlement. 2. Current settlement algebra does not correctly apply loss factors, as QAO/QAB quantities (SO trades) may have a direction but is actually a reduction in the overall flow in the opposite direction. For example, where there are negative SO trades being used by the TSO to reduce the overall import (positive) flow on the Interconnector. 3. qC for Interconnectors is based on the Connection Point (i.e. the remote end in GB) and therefore needs to have losses applied to translate to the I-SEM side for settlement. 4. However, loss factor application should always be a multiplication by qC, as qC always reflects an import (i.e. capacity provided to the I-SEM). Current settlement algebra does not address this. | | | | | |
| **Code Objectives Furthered**  *(State the Code Objectives the Proposal furthers, see Section 1.3 of Part A and/or Section A.2.1.4 of Part B of the T&SC for Code Objectives)* | | | | | |
| * + - * 1. to ensure no undue discrimination between persons who are parties to the Code;   By correcting the error in the current drafting of Interconnector Loss factor application, Interconnector units will be settled according to the intention of the market design and Settlement algebra will apply loss factors fairly to Interconnector variables qC and QAO/QAB by giving consideration to whether the unit is importing or exporting. | | | | | |
| **Implication of not implementing the Modification Proposal**  *(State the possible outcomes should the Modification Proposal not be implemented)* | | | | | |
| If this modification is not implemented Settlement algebra to incorrectly address loss factor application to Interconnectors (QAB/QAB and qC). | | | | | |
| **Working Group**  *(State if Working Group considered necessary to develop proposal)* | | | **Impacts**  *(Indicate the impacts on systems, resources, processes and/or procedures; also indicate impacts on any other Market Code such as Capacity Marker Code, Grid Code, Exchange Rules etc.)* | | |
| n/a | | | Impact Assessment required for system impacts | | |
| ***Please return this form to Secretariat by email to*** [balancingmodifications@sem-o.com](mailto:balancingmodifications@sem-o.com) | | | | | |