

The Single Electricity Market (SEM)

Part A Agreed Procedure 2: Interconnector User Capacity Right Calculation and Dispatch Notification

Version 28.0

**18 August 2023**

SEM Part A Agreed Procedure

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| Title | Part A Agreed Procedure 2: Interconnector User Capacity Right Calculation and Dispatch Notification |
| Version | 28.0 |
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**DOCUMENT HISTORY**

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| Version | Date | Author | Comment |
| 1.0 | 18/10/2006 | SEM Implementation Team | Incorporation of more comments |
| 2.3a | 10/04/2007 | Regulatory Authorities | Updated with RA397 and Code 1.3 |
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| 27.0 | 07/12/2022 | SEMO | SEMO Baseline Documentation at V27.0 |
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**RELATED DOCUMENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| Document Title | Version | Date | By |
| Trading and Settlement Code | Version 28.0 | 18th August 2023 | SEMO |
| BETTA Operational Procedures | Version 3.0 | Nov 2005 | SONI |
| Moyle Interconnector Procedures | Version 1.0 | 07th March 2005 | SONI |
| Agreed Procedure 1 "Participant and Unit Registration and Deregistration" |  |  |  |
| Agreed Procedure 4 “Transaction Submission and Validation” |  |  |  |
| Agreed Procedure 6 “Publications” |  |  |  |
| Agreed Procedure 11 "Market System Operation, Testing, Upgrading and Support" |  |  |  |

1. Introduction
   1. Background and Purpose

This Agreed Procedure describes the specific procedures for the treatment of Interconnectors which connect the Transmission Systems of Ireland or Northern Ireland with systems outside Ireland and Northern Ireland and which interact with the SEM (the “Single Electricity Market”). This Agreed Procedure sets out the processes for the operation of Interconnectors as required by the Trading and Settlement Code (the “Code”) and with which Parties to the Code must comply.

* 1. Scope Of Agreed Procedure

This Agreed Procedure is a definition of procedural steps to be followed by the Market Operator, Interconnector Owner, Interconnector Administrator(s), System Operator(s) and Participants. It forms an annexe to, and is governed by, the Code. This document is a statement of process and procedure. Parties’ rights and obligations are set out in the Code.

* 1. Definitions

Save as expressly defined, words and expressions defined in the Code shall have the same meanings when used in this Agreed Procedure. Abbreviations and definitions that are specific to this Agreed Procedure are set out within Appendix 1.

References to particular sections relate internally to this Agreed Procedure unless specifically noted.

* 1. Compliance With Agreed Procedure

Compliance with this Agreed Procedure is required under the terms as set out the Code.

1. Descriptive Overview

Interconnectors and their Units have special treatment under the SEM which differs from that of other Generator Units.

The Code provides that an Interconnector Owner shall register an Interconnector using Type 1 Channel, and in doing so shall appoint an Interconnector Administrator to perform day-to-day functions under the Code. The Interconnector Administrator will be designated as the responsible Party for all Type 2 Channel and Type 3 Channel communications in respect of an Interconnector.

Any procedures established for the interface to any relevant market outside SEM are outside the scope of this Agreed Procedure.

For each Interconnector, an Interconnector Error Unit and an Interconnector Residual Capacity Unit shall be registered. The Interconnector Error Unit is used for managing and settling Interconnector imbalances. The Interconnector Residual Capacity Unit is intended for the utilisation of residual capacity by the relevant System Operator, subject to commercial agreement.

On registration of an Interconnector, the Interconnector Owner shall ensure that the Interconnector Administrator is registered and that the Interconnector Error Unit is registered to the Interconnector Administrator. The System Operator shall register the Interconnector Residual Capacity Unit.

The procedures to be followed by the Interconnector Administrator in determining the Active Interconnector Unit Capacity Holdings and in managing Interconnector operations fall outside the scope of this Agreed Procedure.

In this Agreed Procedure, whenever a Party is required to submit data via a Type 1 Channel, then the person submitting the data on behalf of that Party must be duly authorised to do so, pursuant to Agreed Procedure 11 "Market System Operation, Testing, Upgrading and Support".

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.

* 1. Registration of Interconnector Entities

An Interconnector is registered in accordance with Agreed Procedure 1 "Participant and Unit Registration and Deregistration". As part of this process, the Interconnector Owner determines the identity of the Interconnector Administrator and the parties responsible for the registration of the Interconnector Residual Capacity Unit and the Interconnector Error Unit.

The Interconnector Owner maintains the Interconnector Registration Data in accordance with Agreed Procedure 1 "Participant and Unit Registration and Deregistration".

The Interconnector Administrator may also maintain the Interconnector Technical Data which is a subset of the Interconnector Registration Data, in accordance with this Agreed Procedure.

* 1. Available Transfer Capacity

The Available Transfer Capacity of an Interconnector is determined by the relevant Interconnector Administrator and is notified to the Market Operator by 10:00 on TD-2.

Revisions to the Available Transfer Capacity after the initial notifications shall be notified to the Market Operator by the relevant Interconnector Administrator as soon as possible following any change in the Available Transfer Capacity.

* 1. Interconnector Unit Nominations and Modified Interconnector Unit Nominations
     1. Pre Gate Window Closure

Interconnector Users may only submit Commercial Offer Data to each Gate Window for the Interconnector Unit which corresponds with that Gate Window, in respect of the corresponding Interconnector. Each Interconnector Unit shall be defined by the following data items:

* The Interconnector to which the Interconnector Unit is registered;
* The Participant ID; and
* The Gate Window Identifier with which the Interconnector Unit is associated.

A Data Transaction containing Commercial Offer Data for Interconnector Units shall include:

* Identification of the Interconnector Unit to which the Commercial Offer Data relates;
* An identifier of the Gate Window to which the Data Transaction relates. The identifier of the Gate Window must match the Gate Window to which the Data Transaction is submitted;
* Up to ten Price Quantity Pairs per Trading Period in the relevant Trading Day; and
* Maximum Interconnector Unit Import Capacity and Maximum Interconnector Unit Export Capacity per Trading Period in the relevant Trading Day.

The Market Operator shall reject any Commercial Offer Data submission for any Interconnector Unit where the identifier of the Gate Window as submitted within the associated Data Transaction does not correspond with the Interconnector Unit Gate Window Identifier.

In accordance with the Code, where no valid Commercial Offer Data is submitted in respect of an Interconnector Unit in a Trading Period, the Maximum Interconnector Unit Import Capacity and the Maximum Interconnector Unit Export Capacity shall be set to zero by the Market Operator.

The Interconnector Administrator shall submit the Active Interconnector Unit Capacity Holding Data for each Interconnector Unit prior to the EA1 Gate Window Closure that is consistent with the Interconnector Available Transfer Capacity (ATC) in each direction.

* + 1. Calculation of Modified Interconnector Unit Nominations

Following the completion of each Ex-Ante One MSP Software Run, Ex-Ante Two MSP Software Run, and Within Day One MSP Software Run, the Market Operator shall:

* Determine Interconnector Unit Nominations for each Interconnector Unit and for each Interconnector based on the relevant inputs (including Commercial Offer Data, Interconnector Technical Data and, in the case of the Ex-Ante One MSP Software Run only, the Active Interconnector Unit Capacity Holding). In calculating the Interconnector Unit Nominations, the Ramp Rate for each Interconnector Unit will be set to a value of 99999.9 MW/min, and the relevant Accepted Aggregate Interconnector Ramp Rate will be applied as a limit across all corresponding Interconnector Units.
* Calculate the Modified Interconnector Unit Nominations (MIUNs), separately for each Interconnector pursuant to paragraph 2.71, by applying the Accepted Aggregate Interconnector Ramp Rate and with respect to the rules in Appendix 2 – Calculation of Modified Interconnector Unit Nominations. The Market Operator shall, in calculating the Modified Interconnector Unit Nominations (MIUNs), take into account the most recently Accepted Available Transfer Capacity for the relevant Interconnector for the Trading Day. Submit to each Interconnector User in respect of its Interconnector Units the corresponding MIUNs, in accordance with Table 1.
* Submit Aggregate Modified Interconnector Unit Nomination (AMIUNs) to the relevant System Operator, in accordance with Table 1. AMIUNs represent aggregate import and export MW values per Trading Period over each Interconnector registered.

The Market Operator shall not calculate Modified Interconnector Unit Nominations in respect of an Interconnector Unit where:

* + Commercial Offer Data was not Accepted within the Gate Window corresponding to the particular MSP Software Run Type for the relevant Trading Day; or
  + Interconnector Unit Nominations have not been calculated as a result of any completed MSP Software Run Type in respect of the relevant Trading Day.

In the case of General Systems Failure, the Market Operator shall set all Modified Interconnector Unit Nominations to zero in respect of the relevant Gate Windows.

Table 1 – Scheduled calculation and submission Timings for IUNs, MIUNs and AMIUNs

| **MSP Software Run** | **Interconnector Unit Nominations** | **Modified Interconnector Unit Nominations** | **Aggregate Modified Interconnector Unit Nominations** |
| --- | --- | --- | --- |
| Ex-Ante One MSP Software Run | By 11:00 on the day prior to the Trading Day | By 11:00 on the day prior to the Trading Day | By 11:00 on the day prior to the Trading Day |
| Ex-Ante Two MSP Software Run | By 13:00 on the day prior to the Trading Day | By 13:00 on the day prior to the Trading Day | By 13:00 on the day prior to the Trading Day |
| Within Day One MSP Software Run | By 09:30 on Trading Day | By 09:30 on Trading Day | By 09:30 on Trading Day |

* 1. SO Interconnector Trades

The System Operator using the Interconnector Residual Capacity Unit shall be entitled under the terms of the Code, subject to commercial agreement, to make SO Interconnector Trades across the relevant Interconnector in either direction, using any available Interconnector capacity which is not allocated to Interconnector Users under the aggregate of the prevailing Modified Interconnector Unit Nominations.

SO Interconnector Trades in respect of any Trading Period must be conducted as follows:

1. For each Trading Period that is within the WD1 Trading Window:
   1. Where an MSP Software Run Cancellation applies in respect of the Within Day One MSP Software Run, SO Interconnector Trades shall be conducted after publication of the associated MSP Software Run Cancellation Report.
   2. Otherwise, SO Interconnector Trades shall be conducted after:
      1. calculation of the Within Day One Market Schedule and the associated Modified Interconnector Unit Nominations; and
      2. after submission to the relevant System Operator of the associated Aggregate Modified Interconnector Unit Nominations.
2. For each Trading Period that is not within the WD1 Trading Window:
   1. Where an MSP Software Run Cancellation applies in respect of the Ex-Ante Two MSP Software Run, SO Interconnector Trades shall be conducted after publication of the associated MSP Software Run Cancellation Report.
   2. Otherwise, SO Interconnector Trades shall be conducted after:
      1. calculation of the Ex-Ante Two Market Schedule and the associated Modified Interconnector Unit Nominations; and
      2. after submission to the relevant System Operator of the associated Aggregate Modified Interconnector Unit Nominations."
   3. Post Ea1 Gate Window Closure Reductions in ATC

In the event of a reduction in the magnitude of the Available Transfer Capacity (this includes reductions in the absolute magnitude of the Maximum Import Available Transfer Capacity and/or the Maximum Export Available Transfer Capacity) after the EA1 Gate Window Closure, then the following shall be performed:

* The Interconnector Administrator shall, as soon as possible, notify the Market Operator of the revised Available Transfer Capacity values via the Available Transfer Capacity Data Transaction.
* The Market Operator shall, as soon as possible, recalculate the Modified Interconnector Unit Nominations and shall re-issue such MIUNs to each Interconnector User for each of their Interconnector Units. The Modified Interconnector Unit Nominations shall be recalculated by the Market Operator in accordance with the rules in Appendix 2 - Calculation of Modified Interconnector Unit Nominations.
* The Market Operator shall, as soon as possible, recalculate the Aggregate Modified Interconnector Unit Nominations (AMIUNs) and shall re-issue such AMIUNs to the relevant System Operator.
  1. Point of application of values

All values which are expressed in MW, MW/min or MWh and which are not Loss-Adjusted in relation to an Interconnector, Interconnector Units, Interconnector Residual Capacity Units or Interconnector Error Units shall be applicable at the point of Connection.

1. Procedure Definition
   1. Interconnector Registration Data Maintenance

The Interconnector Owner or Interconnector Administrator as appropriate shall inform the Market Operator of changes to the Interconnector Technical Data at least 5 Working Days prior to EA1 Gate Window Closure for the first Trading Day for which the relevant data shall be effective. Upon receipt, the Market Operator shall confirm receipt of the data by email by 11:00 on the Working Day following receipt. In the absence of receipt of such confirmation, the relevant Party shall re-submit the relevant data. Within one Working Day of confirmation of receipt by the Market Operator, the Interconnector Administrator shall issue an email to Interconnector Users informing them of the change in Interconnector Technical Data.

Within 1 Working Day of receipt, the Market Operator shall submit the revised Interconnector Technical Data to the relevant System Operator.

* 1. Active Interconnector Unit Capacity Holdings

Each Interconnector Administrator shall determine the Active Interconnector Unit Capacity Holdings for its Interconnector (consisting of the Active Interconnector Unit Import Capacity Holding and the Active Interconnector Unit Export Capacity Holding) for each Trading Period in the Optimisation Time Horizon. The Active Interconnector Unit Capacity Holding Data Transaction shall be submitted to the Market Operator by the Interconnector Administrator, by the EA1 Gate Window Closure, as set out in Appendix K of the Code.

The Market Operator shall notify each Interconnector User of its Active Interconnector Unit Capacity Holdings in respect of its registered Interconnector Units (where capacity is held), as soon as possible following receipt of the associated Data Transaction.

* 1. Initial Available Transfer Capacity Notification

The Interconnector Administrator shall determine the Available Transfer Capacity (consisting of the Maximum Import Available Transfer Capacity and the Maximum Export Available Transfer Capacity) for each Interconnector for each Trading Period in the Optimisation Time Horizon. The Available Transfer Capacity Data Transaction shall be submitted by the Interconnector Administrator to the Market Operator by the EA1 Gate Window Closure, as set out in Appendix K of the Code.

The Market Operator shall publish the Available Transfer Capacity via the MPI and the Market Operator Website, as soon as possible following receipt of the associated Data Transaction.

* 1. Updates to Available Transfer Capacity

Whenever there is a change to the ATC on an Interconnector after the initial notification in 3.2, the following shall apply:

* The relevant Interconnector Administrator shall notify the System Operator, as soon as possible.
* Where any change in ATC occurs prior to the EA1 Gate Window Closure, the relevant Interconnector Administrator shall submit the revised ATC to the Market Operator as soon as possible, in accordance with the Interconnector Available Transfer Capacity Data Transaction set out in Appendix K of the Code.
* The relevant Interconnector Administrator for each corresponding Interconnector shall submit the final ATCs to the Market Operator by TD+1 12:00 hours, in accordance with the Interconnector Available Transfer Capacity Data Transaction set out in Appendix K of the Code.

Whenever there is a change in Available Transfer Capacity prior to the EA1 Gate Window Closure, then the Interconnector Administrator shall submit the revised data to the Market Operator and shall, where possible, take account of such change in order to recalculate and resubmit the Active Interconnector Unit Capacity Holdings prior to the EA1 Gate Window Closure.

Whenever there is a reduction in ATC, from the ATC used to produce the Active Interconnector Unit Capacity Holdings, prior to the calculation of the MIUNs by the Market Operator, then where possible, the Market Operator shall take into account the reduction in ATC in calculating the MIUNs (in paragraph 3.5 of this Agreed Procedure).

Whenever there is a change in ATC after the initial calculation of MIUNs, then the Market Operator shall recalculate revised MIUNs, taking into account the corresponding change in ATC. The revised MIUNs shall each be in the same direction and must not exceed in absolute magnitude the value of the corresponding IUNs.

The Market Operator shall submit:

1. as soon as possible after identifying the change in ATC, the revised MIUNs to the relevant Interconnector Users.
2. as soon as possible after receiving notification of the reduction in ATC, the Aggregate MIUNs to the relevant System Operator.
   1. Modified Interconnector Unit Nominations

Modified Interconnector Unit Nominations are derived from the outputs of an MSP Software Run. The Market Operator shall complete scheduled MSP Software Runs that are conducted prior to the end of the Trading Day (taking into account the provisions in respect of MSP Software Run Cancellation), using the corresponding Commercial Offer Data for the Interconnector Units, a Ramp Rate for each Interconnector Unit set to a value of 99999.9 MW/min, and the Accepted Aggregate Interconnector Ramp Rate for the relevant Interconnector, applied as a limit across all Interconnector Units.

* The Ex-Ante One MSP Software Run shall be performed to determine the Ex-Ante One Market Schedule by 11:00 hours on the day prior to the Trading Day. For each Interconnector Unit, the Ex-Ante One MSP Software Run shall, in addition to the other input data, use the corresponding Active Interconnector Unit Capacity Holdings.
* The Ex-Ante Two MSP Software Run shall be performed to determine the Ex-Ante Two Market Schedule by 13:00 hours on the day prior to the Trading Day.
* The Within Day One MSP Software Run shall be performed to determine the Within Day One Market Schedule by 09:30 hours on the Trading Day.

The Interconnector Unit Nominations for each Interconnector Unit and Trading Period are equal to the corresponding value of Market Schedule Quantity as calculated by the relevant MSP Software Run.

Following the successful completion of an MSP Software Run that is prior to the end of the Trading Day, the Market Operator shall calculatethe Modified Interconnector Unit Nominations (based on the Interconnector Unit Nominations)and submit such relevant calculated values to Interconnector Users as soon as possible. In addition to such calculations, the Modified Interconnector Unit Nominations shall be calculated in respect of a particular Trading Day, on submission of an Available Transfer Capacity Data Transaction after the calculation of Interconnector Unit Nominations for the relevant Interconnector as derived from the Ex-Ante One MSP Software Run.

As soon as possible following each calculation of Modified Interconnector Unit Nominations, the Market Operator shall:

* Submit the Aggregate Modified Interconnector Unit Nominations for each Interconnector to the relevant System Operator.
* Submit the Modified Interconnector Unit Nominations in respect of each Interconnector to the relevant Interconnector Administrator.
* Submit the Modified Interconnector Unit Nominations in respect of the Interconnector Units as registered to the relevant Interconnector User.

1. Procedural Steps

Swimlanes are provided as an illustration of the Procedural Steps. The Procedural Steps take precedence, in the event of conflict between the swimlanes and the Procedural Steps.

* 1. Swimlane - Interconnector Registration Data Maintenance



* 1. Interconnector Technical Data Maintenance

| **#** | **Procedural Step** | **Timing** | **Method** | **By/ From** | **To** | **Data Transaction** |
| --- | --- | --- | --- | --- | --- | --- |
| 1.1 | Submit changes to Interconnector Technical Data | At least 5 Working Days prior to EA1 Gate Window Closure for the Trading Day | Type 1 Channel / Type 3 Channel | Interconnector Administrator / Interconnector Owner | Market Operator | Interconnector Technical Data |
| 1.2 | Notify change in Interconnector Technical Data | Within 1 WD of receipt, by 11:00 hrs. | Email | Market Operator | System Operator | Interconnector Technical Data |
| 1.3 | If the Interconnector Technical Data Transaction has been received via Type 1 Channel, send confirmation to Sending Party. | Within 1 WD of receipt, by 11:00 hrs | Email | Market Operator | Interconnector Administrator / Interconnector Owner |  |
| 1.4 | Enter Interconnector Technical Data changes in Central Market Systems. | By the EA1 Gate Window Closure for the Trading Day | Central Market Systems | Market Operator | - | Interconnector Technical Data |
| 1.5 | Inform Interconnector Users of change in Interconnector Technical Data.  **End Process** | Within one Working Day of confirmation of receipt of change by the Market Operator | Email | Interconnector Administrator | Interconnector Users | Interconnector Technical Data |

* 1. Swimlane - Active Interconnector Unit Capacity Holdings



* 1. Submission of Active Interconnector Unit Capacity Holdings

| **#** | **Procedural Step** | **Timing** | **Method** | **By/ From** | **To** | **Data Transaction** |
| --- | --- | --- | --- | --- | --- | --- |
| 2.1 | Calculate the Active Interconnector Unit Capacity Holdings for the relevant Interconnector Units and submit to the Market Operator. | EA1 Gate Window Closure | Type 3 Channel | Interconnector Administrator | Market Operator | Active Interconnector Unit Capacity Holding |
| 2.2 | Notify Interconnector Users of their Active Interconnector Unit Capacity Holdings.  **End Process.** | EA1 Gate Window Closure | Type 3 Channel | Market Operator | Interconnector Users | Active Interconnector Unit Capacity Holding |

* 1. Swimlane - Initial Available Transfer Capacity Notification



* 1. Submission of Initial Available transfer Capacity

| **#** | **Procedural Step** | **Timing** | **Method** | **By/ From** | **To** | **Data Transaction** |
| --- | --- | --- | --- | --- | --- | --- |
| 3.1 | Calculate the Available Transfer Capacity for the relevant Interconnector and submit to the Market Operator. | 10:00, TD-2 and as updated | Type 3 Channel | Interconnector Administrator | Market Operator | Interconnector Available Transfer Capacity |
| 3.2 | Publish the Interconnector Available Transfer Capacity Data Transaction.  **End Process.** | 10:00, TD-2 and as updated | Market Operator Website | Market Operator | General Public | Interconnector Available Transfer Capacity |

* 1. Swimlane – Updates to Available Transfer Capacity



* 1. Updates to Available Transfer Capacity

| **#** | **Procedural Step** | **Timing** | **Method** | **By/ From** | **To** | **Data Transaction** |
| --- | --- | --- | --- | --- | --- | --- |
| 4.1 | Identify an update to Interconnector Available Transfer Capacity for a particular Interconnector.  Continue from step 4.2. | As occurs | - | Interconnector Administrator | - |  |
| 4.2 | * If an update is identified by the EA1 Gate Window Closure, include in initial ATC Data Transaction as detailed in section 4.6, plus use to calculate the Active Interconnector Unit Capacity Holdings Data Transaction. **End Process.** * If an update is identified after the EA1 Gate Window Closure:   + If after the end of the Trading Day, submit data as part of revised Interconnector Available Transfer Capacity Data Transaction. Continue from step 4.4; else   + Submit Interconnector ATC Data Transaction, then continue from step 4.3. | 1. As occurs | 1. Type 3 Channel | Interconnector Administrator | Market Operator | Interconnector Available Transfer Capacity  Revised Interconnector Available Transfer Capacity |
| 4.3 | As received, publish Interconnector Available Transfer Capacity data. **End Process**, then continue with the process as set out in section 4.10 (starting at step 5.1). | As soon as possible post receipt | Type 3 Channel | Market Operator | Market Operator website | Interconnector Available Transfer Capacity |
| 4.4 | Submit final ATC to Market Operator.  **End Process.** | By TD+1 12:00 hours | Type 3 Channel | Interconnector Administrator | Market Operator | Interconnector Available Transfer Capacity |

* 1. Swimlane – Calculation of MIUNs



* 1. Calculation of Modified Interconnector Unit Nominations

|  | **Procedural Step** | **Timing** | **Method** | **By/ From** | **To** | **Data Transaction** |
| --- | --- | --- | --- | --- | --- | --- |
| 5.1 | Start either:   * On submission of an Available Transfer Capacity Data Transaction after the calculation of Interconnector Unit Nominations for the relevant Interconnector as derived from the Ex-Ante One MSP Software Run, continue from step 5.2; or * On successful completion of an Ex-Ante One MSP Software Run, Ex-Ante Two MSP Software Run or Within Day One MSP Software Run, continue from step 5.2. | By EA1 Gate Window Closure | Type 3 Channel | Interconnector Administrator / System Operator | Market Operator | - |
| 5.2 | Calculate Modified Interconnector Unit Nominations for all Interconnector Units where the associated Interconnector Unit Nominations have been previously calculated for the associated Trading Period and the Interconnector Dispatch Schedule. The Modified Interconnector Unit Nominations will be based on the latest Accepted values of:   * Interconnector Unit Nominations * Interconnector Registration Data | As soon as possible, once inputs are received | MIUN Calculator | Market Operator | - | - |
| 5.3 | Submit MIUNs to Interconnector Users. | As soon as possible | MPI | Market Operator | Interconnector Users | Modified Interconnector Unit Nominations |
| 5.4 | Submit Interconnector Dispatch Schedule to Interconnector Administrator. | As soon as possible | Type 3 Channel | Market Operator | Interconnector Administrator | Interconnector Dispatch Schedule |
| 5.5 | Submit Aggregate Modified Interconnector Unit Nominations to relevant System Operator(s).  **End Process.** | As soon as possible | Type 3 Channel | Market Operator | System Operator(s) | Aggregate Modified Interconnector Unit Nominations |

1. Definitions and Abbreviations

Definitions

|  |  |
| --- | --- |
| Accepted | As defined in the Code |
| Active Interconnector Unit Capacity Holding | As defined in the Code |
| Active Interconnector Unit Capacity Holding Data | As defined in the Code |
| Active Interconnector Unit Export Capacity Holding | As defined in the Code |
| Active Interconnector Unit Import Capacity Holding | As defined in the Code |
| Aggregate Interconnector Ramp Rate | As defined in the Code |
| Aggregate Modified Interconnector Unit Nomination | As defined in the Code |
| Agreed Procedure | As defined in the Code |
| Available Transfer Capacity | As defined in the Code |
| Capacity Payment | As defined in the Code |
| Change Point | As defined in Appendix 2 – Calculation of Modified Interconnector Unit Nominations |
| Code | As defined in the Code |
| Commercial Offer Data | As defined in the Code |
| Ex-Ante One (EA1) Market Schedule | As defined in the Code |
| Ex-Ante One (EA1) MSP Software Run | As defined in the Code |
| Ex-Ante Two (EA2) Market Schedule | As defined in the Code |
| Ex-Ante Two (EA2) MSP Software Run | As defined in the Code |
| Gate Window Closure | As defined in the Code |
| Interconnector | As defined in the Code |
| Interconnector Administrator | As defined in the Code |
| Interconnector Dispatch Schedule Data Transaction | As defined in the Code |
| Interconnector Error Unit | As defined in the Code |
| Interconnector Owner | As defined in the Code |
| Interconnector Registration Data | As defined in the Code |
| Interconnector Residual Capacity Unit | As defined in the Code |
| Interconnector Technical Data | As defined in the Code |
| Interconnector Unit | As defined in the Code |
| Interconnector Unit Nominations | As defined in the Code |
| Interconnector User | As defined in the Code |
| Interconnector Technical Data | As defined in the Code |
| Intersection | As defined in Appendix 2 – Calculation of Modified Interconnector Unit Nominations |
| Logical Interconnector | As defined in Appendix 2 – Calculation of Modified Interconnector Unit Nominations |
| Market Operator | As defined in the Code |
| Market Operator Website | as defined in Agreed Procedure 1 "Participant and Unit Registration and Deregistration" |
| Market Participant Interface | as defined in Agreed Procedure 1 "Participant and Unit Registration and Deregistration" |
| Market Schedule Quantity | As defined in the Code |
| Maximum Export Available Transfer Capacity | As defined in the Code |
| Maximum Export Available Transfer Capacity | As defined in the Code |
| Maximum Interconnector Unit Export Capacity | As defined in the Code |
| Maximum Interconnector Unit Import Capacity | As defined in the Code |
| Modified Interconnector Unit Nominations | As defined in the Code |
| Minimum Interconnector Export Level | As defined in the Code |
| Minimum Interconnector Import Level | As defined in the Code |
| MIUN Calculator | As defined in the Code |
| No Load Cost | As defined in the Code |
| Optimisation Time Horizon | As defined in the Code |
| **Original Interconnector Unit Nomination** | The Interconnector Unit Nomination for an Interconnector Unit as calculated by the MSP Software Run where the MSP Software Run Type matches the Gate Window identifier associated with that Interconnector Unit. |
| **Original Modified Interconnector Unit Nomination** | The Modified Interconnector Unit Nomination for an Interconnector Unit as calculated by the MIUN Calculator immediately following the MSP Software Run where the MSP Software Run Type matches the Gate Window identifier associated with that Interconnector Unit. |
| Participant | As defined in the Code |
| Party | As defined in the Code |
| Pool | As defined in the Code |
| Price Quantity Pair | As defined in the Code |
| Quantity | As defined in the Code |
| Ramp Rate | As defined in the Code |
| Regulatory Authorities | As defined in the Code |
| Run-Through | As defined in Appendix 2 – Calculation of Modified Interconnector Unit Nominations |
| Settlement Period | As defined in the Code |
| Single Electricity Market | As defined in the Code |
| Start Up Costs | As defined in the Code |
| SO Interconnector Export Quantity | As defined in the Code |
| SO Interconnector Import Quantity | As defined in the Code |
| SO Interconnector Trade | As defined in the Code |
| System Operator | As defined in the Code |
| Trading Day | As defined in the Code |
| Trading Period | As defined in the Code |
| Trip | As defined in Appendix 2 – Calculation of Modified Interconnector Unit Nominations |
| Unit | As defined in the Code |
| Within Day One (WD1) Market Schedule | As defined in the Code |
| Within Day One (WD1) MSP Software Run | As defined in the Code |

Abbreviations

|  |  |
| --- | --- |
| AMIUN | Aggregate Modified Interconnector Unit Nomination |
| ATC | Available Transfer Capacity |
| CMS | Central Market Systems |
| IUN | Interconnector Unit Nomination |
| MIUN | Modified Interconnector Unit Nomination |
| MPI | Market Participant Interface |
| MSQ | Market Schedule Quantity |
| SEM | Single Electricity Market |
| TD | Trading Day |

1. Calculation of Modified Interconnector Unit Nominations

Introduction

This Appendix describes in general terms the rules used by the Market Operator to calculate Modified Interconnector Unit Nominations from the Interconnector Unit Nominations.

Definitions

In this Appendix:

|  |  |
| --- | --- |
| **“Change Point”** | is a point that occurs whenever any Interconnector Unit Nomination changes or whenever the Aggregate Interconnector Ramp Rate changes |
| **“Intersection”** | means the situation where the Interconnector is dispatched upwards but before the target can be achieved the Interconnector must be dispatched downwards in order to achieve the next Change Point’s target |
| **“Logical Interconnector”** | means the interconnector in which electricity flows in one direction, i.e. electricity flowing from Scotland to Northern Ireland will form one logical interconnector and electricity flowing from Northern Ireland to Scotland will form another logical interconnector |
| **“Run-Through”** | Means the situation where the Interconnector is dispatched upwards but cannot achieve its target by the next Change Point, and cannot achieve the Change Point’s expected position at the Change Point boundary |
| **“Trip”** | Means a technical failure on an Interconnector which causes a reduction in the magnitude of the Available Transfer Capacity in either direction |
| **“Deadband”** | Means the energy band between the Minimum Interconnector Import Level and the Minimum interconnector Export Level |
| **“ Dominant Direction”** | Is the direction of the net Interconnector Unit Nominations in the last Trading Period in which there was an interconnector flow i.e. import or export |
|  |  |
| **“Excessive Area”** | In respect of a particular Trading Period and the current MIUN Calculator run, any instance where either the Remaining Area is greater than zero and the sum of all positive Original IUNs for all Interconnectors Units for which Original MIUNs have not yet been calculated is less than the Remaining Area, or the Remaining Area is less than zero and the sum of all negative Original IUNs for all Interconnectors Units for which Original MIUNs have not yet been calculated is greater than the Remaining Area |
| **“Remaining Area”** | In respect of a particular Trading Period and the current MIUN Calculator run, the area under the Interconnector Dispatch Schedule minus the sum of all Original MIUNs for all Interconnector Units for which such Original MIUNs have been calculated |
| **“Current Run Start”** | In respect of the current MIUN Calculator run, the start point of a period of ramping up or ramping down at the maximum Interconnector Ramp Rate, within such period where a particular instance of Excessive Area which is not equal to zero occurs |
| **“Current Run Stop”** | In respect of the current MIUN Calculator run, the end point of a period of ramping up or ramping down at the maximum Interconnector Ramp Rate, within such period where a particular instance of Excessive Area which is not equal to zero occurs |
| **“Previous Run Start”** | In respect of the most recently completed MIUN Calculator run for the same Trading Day and Interconnector, the start point of a period of ramping up or ramping down at the maximum Interconnector Ramp Rate that overlaps with the period within the current MIUN Calculator run that is defined by the Current Run Start and Current Run Stop points |
| **“Previous Run Stop”** | In respect of the most recently completed MIUN Calculator run for the same Trading Day and Interconnector, the end point of a period of ramping up or ramping down at the maximum Interconnector Ramp Rate that overlaps with the period within the current MIUN Calculator run that is defined by the Current Run Start and Current Run Stop points |

Rules for the calculation of the Modified Interconnector Unit Nominations (“MIUN”)

Values of MIUNs

1. MIUNs shall be calculated for each Interconnector separately.
2. The value of each MIUN, in respect of a particular Interconnector Unit and for a particular Trading Period, must be in the same direction (i.e. both positive or both negative) as the corresponding Interconnector Unit Nomination (IUN).
3. The value of each MIUN, in respect of a particular Interconnector Unit and for a particular Trading Period, must not exceed in absolute magnitude the corresponding Original IUN or, where an Original MIUN has previously been determined , the Original MIUN.
4. In calculating the MIUNs for each Trading Period:
   1. where the sum of the IUNs is greater in absolute terms than the absolute value of the Interconnector Import ATC, the IUNs will be reduced such that the resulting MIUN will respect the import ATC value.
   2. where the sum of all IUNs is greater in absolute terms than the absolute value of the Interconnector Export ATC, the IUNs will be reduced such that the resulting MIUNs will respect the export ATC value.

Application of the Interconnector Ramp Rate

1. The Interconnector Ramp Rate applies to the sum of all the IUNs (i.e. import and export) and not to any individual IUNs.
2. Where the sum of all IUNs for a particular Trading Period and Interconnector, is equal for two consecutive Trading Periods, each corresponding MIUN for that Trading Period shall be set equal to the relevant IUN.
3. Ramping may take place over any number of Trading Periods, including Trading Periods within the previous day if necessary. Where ramping occurs over multiple Trading Periods and there is a conflict in the rules as set out in this Appendix, the ramping rules shall take precedence.
4. Where the absolute value of an IUN for a Trading Period (B) is less than the absolute value of the IUN in the immediately preceding Trading Period (A) and the values (A) and (B) are of the same sign, ramping in respect of the Unit shall occur in order to reach the value of the IUN for Trading Period (B) by the start of Trading Period (B).
5. Where the absolute value of an IUN for a Trading Period (B) is greater than the absolute value of the IUN for the immediately preceding Trading Period (A) and the values (A) and (B) are of the same sign, ramping in respect of the Unit shall occur at the start of Trading Period (B). This ramping may take place over any number of Trading Periods.
6. Where the value of an IUN for a Trading Period (B) is of opposite sign to the value of the IUN for the immediately preceding Trading Period (A), ramping shall occur by the end of Trading Period (A) for the value of the IUN in Trading Period (A) and ramping shall occur at the start of Trading Period (B) for the value of the IUN in Trading Period (B).
7. Where IUNs change direction between successive Trading Periods (i.e. from positive to negative or negative to positive) and a Deadband does not apply, ramping shall occur such that the value at the boundary between the two affected Trading Periods is zero.
8. If a Trip occurs on an Interconnector, then the sum of all IUNs shall be considered to ramp instantly to the revised value of ATC.

Application of the Minimum Interconnector Import Level, Minimum Interconnector Export Level and Deadband

1. An Interconnector may have an associated Deadband, within which the relevant Interconnector is not able to operate.
2. The Deadband for an Interconnector shall apply between (but excluding) the Minimum Interconnector Export Level and the Minimum Interconnector Import Level.
3. Any Interconnector for which the Minimum Interconnector Export Level and Minimum Interconnector Import Level are equal to zero shall be considered to have no Deadband.
4. Where an Interconnector has a Deadband, the Interconnector shall be considered to ramp between zero (0) and the associated Minimum Interconnector Import Level instantaneously.
5. Where an Interconnector has a Deadband, the Interconnector shall be considered to ramp between zero (0) and the associated Minimum Interconnector Export Level instantaneously.

Adjustments when Net Interconnector Flow is within a Deadband

1. If the total IUNs for a Trading Period are in the Deadband and all IUNs are in the Dominant Direction, then each of the IUNs should be considered to be zero for the purpose of calculating the MIUNs.
2. Where IUNs exist in both directions and the sum of all IUNs for a particular Interconnector and Trading Period is within the Deadband for the Interconnector:
   1. Where the sum of the IUNs net to exactly zero:
      1. If the sum of the IUNs in each direction are within the Deadband, then the IUNs used in the calculation of MIUNs in both directions shall be reduced to zero.
      2. If the sum of the IUNs in each direction are outside the Deadband, the IUNs used in the calculation of MIUNs in both directions will remain unchanged.
   2. If the sum of the IUNs in any direction are within the Deadband, the IUNs in that direction shall be considered to be zero for the purpose of calculating the MIUNs.
   3. Where the sum of IUNs for each direction are outside the Deadband:
      1. The IUNs in the same direction (i.e. import or export) as the Dominant Direction used in the calculation of MIUNs will remain unchanged;
      2. The IUNs in the opposite direction (i.e. import or export) to the Dominant Direction shall be reduced on a pro-rata basis, such that the resulting net flow is outside the Deadband.

***Fixing of MIUNs in subsequent MIUN calculation runs***

1. In calculating the MIUNs in each Trading Period, each MIUN calculation shall, where possible:
   1. Fix the Original MIUNs for Interconnector Units associated with the EA1 Gate Window where such Original MIUNs have been determined.
   2. Fix the Original MIUNs for Interconnector Units associated with the EA2 Gate Window where such Original MIUNs have been determined.
   3. Fix the Original MIUNs for Interconnector Units associated with the WD1 Gate Window where such Original MIUNs have been determined.
   4. Allocate the remaining energy available as defined by the Interconnector Dispatch Schedule to Interconnector

Treatment of SO Interconnector Trades

1. SO Interconnector Trades can only occur once the final set of Ex-Ante MIUNs in respect of a particular Trading Period have been determined by the Market Operator (i.e. resulting from an Ex Ante One MSP Software Run, Ex Ante Two MSP Software Run or Within Day One MSP Software Run).
2. In all cases SO Interconnector Trades will be reduced first as required to minimise the effect on IUNs.

**Treatment of Excessive Area**

1. In any Trading Period where:
   1. the Remaining Area is greater than zero and the sum of all positive Original IUNs for all Interconnectors Units for which Original MIUNs have not yet been calculated is less than the Remaining Area, or
   2. the Remaining Area is less than zero and the sum of all negative Original IUNs for all Interconnectors Units for which Original MIUNs have not yet been calculated is greater than the Remaining Area,

each such instance shall be addressed in reverse chronological order (i.e. latest within the relevant Trading Day first) as follows:

1. Identify the start point (“Current Run Start”) and end point (“Current Run Stop”) of the continuous period of ramping within which the Excessive Area occurs, where such period of ramping is part of the Interconnector Dispatch Schedule as calculated within the current MIUN Calculator run. A continuous ramping period through zero MW shall be considered to be two separate periods of ramping (each with start and end points).
2. Identify the start point (“Previous Run Start”) and end point (“Previous Run Stop”) of the continuous period of ramping within which the Excessive Area occurs, where such period of ramping is part of the most recently calculated Interconnector Dispatch Schedule for the same Trading Day and Interconnector. A continuous period of ramping through zero MW shall be considered to be two separate periods of ramping (each with start and end points).
3. If the Current Run Start and Current Run Stop points are both within Trading Periods where the corresponding sum of the IUNs for all Interconnector Units for which Original MIUNs have not been determined is zero, then proceed to step 23e. Otherwise, proceed to step 23d.
4. Move the “Current Run Stop” time on a minute-by-minute basis towards the corresponding “Previous Run Stop” point and recalculate the area under the curve as defined by the Interconnector Dispatch Profile and the associated Excessive Area, until Excessive Area in the affected Trading Period does not apply. The Current Run Stop point shall not be moved beyond the Previous Run Stop point. If all instances of Excessive Area are addressed and a feasible Interconnector profile is produced, proceed to step 23f. Otherwise, proceed to step 23e.
5. If a profile cannot be determined from step 23c or 23d such that Original MIUNs are preserved and a feasible Interconnector profile is determined:
   * 1. The MIUNs for the Units for which MIUNs have not previously been determined will be set to zero for all Trading Periods between (and including) the start and the end of the ramping period which caused the Excessive Area to occur.
     2. The Interconnector Dispatch Schedule will be adjusted to ensure a feasible profile, which shall ensure preservation of all Original MIUNs.
     3. Proceed to step 23f.
6. Allocate the difference between the area under the calculated Interconnector Dispatch Schedule and the sum of all Original MIUNs to those Interconnector Units for which Original MIUNs have not previously been determined.