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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** | **10 October 2012** | **Standard** | **Mod\_24\_12** |
| **Contact Details for Modification Proposal Originator** |
| **Name** | **Telephone number** | **Email address** |
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| **Modification Proposal Title** |
| **Amendments to the MIUN Calculator to address instances of Excessive Area** |
| **Documents affected***(delete as appropriate)* | **Section(s) Affected** | **Version number of T&SC or AP used in Drafting** |
| **AP** | **Agreed Procedure 2 (Glossary, Appendix 2)** | **V11.0** |
| **Explanation of Proposed Change***(mandatory by originator)* |
| The Intra Day Trading design requires that for Interconnector Units, EA1 capacity allocations (Modified Interconnector Unit Nominations - MIUNs) will be treated as fixed in the EA2 MSP Software Run and EA1 and EA2 capacity allocations will be treated as fixed in the WD1 MSP Software Run. As part of the Intra Day Trading changes, the MIUN Calculator was amended to implement such fixing of MIUNs in runs subsequent to EA1 for the same Trading Day. However, there are certain circumstances where the fixing of MIUNs (EA1 and/or EA2) may not be possible:* Where there is a change in Available Transfer Capacity (ATC).
* Breach of Deadband limits (Minimum Interconnector Import/Export Capacity).

An additional scenario has been identified (“Scenario 35 – Extreme Ramping”) where MIUNs determined following a previous MSP Software Run for the Trading Day may be impacted by MIUN calculations following a subsequent MSP Software Run. This scenario is likely to be rare but will depend on trading patterns and can arise when:* the Interconnector profile is constrained by the Interconnector Ramp Rate such that ramping over multiple Trading Periods is required (“Run Through”) to achieve ramping to a peak/trough of Interconnector Unit Nominations (IUNs), and
* there is a change in the dominant direction of ramping between gates (EA1, EA2, WD1).

Whilst the scenario identified has never occurred in live operations, if the scenario occurs it could cause “Excessive Area” and, under the current ramping rules, it would not be possible to 1) preserve previously determined MIUNs and 2) ensure that |MIUN|<=|IUN| for Units where no MIUNs have been previously determined. SEMO has developed a solution to address the issue with the vendor of the MIUN Calculator, to ensure that the key principles of Intra-Day Trading are preserved:1. MIUNs<=IUNs
2. Previously calculated MIUNs should be preserved (where possible), in priority order.
3. Remaining MIUN area should be allocated to the IUs for which MIUNs have not been calculated yet (i.e. EA1 allocated first, then EA2, then WD1).

This Modification clarifies the treatment of instances of “Excessive Area” when it occurs, requiring profiling end points to be amended to ensure:* fixing of previously determined MIUNs for the same Trading Day;
* absolute values of MIUNs are always less than the absolute value of corresponding IUNs; and
* a feasible Interconnector profile is determined.
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| **Legal Drafting Change***(Clearly show proposed code change using* ***tracked*** *changes, if proposer fails to identify changes, please indicate best estimate of potential changes)* |
| Definitions*[additional definitions as below to be appended to the existing list]*

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| **“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 Volume 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 Volume which is not equal to zero occurs |
| **“Last 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 |
| **“Last 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 MIUNs1. 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 Rate1. 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 Deadband1. 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 Deadband1. 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 Trades1. 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 (“Last Run Start”) and end point (“Last 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 “Last 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 Last 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.
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| **Modification Proposal Justification***(Clearly state the reason for the Modification)* |
| The current MIUN calculations allow previously determined MIUNs to be adjusted in situations where Excessive Area occurs, as there are no rules to account for such instances. This is not consistent with the Intra-Day Trading design or the principles underpinning the EU Congestion Management Guidelines.It should be noted that this is a scenario that has never occurred in live operations, but has instead been identified by SEMO as part of its ongoing extension of testing processes. Whilst unlikely, the scenario is possible and should be addressed as soon as possible, as the risk of occurrence will increase following EWIC Go-Live. If previously determined MIUNs are affected following subsequent MSP Software Runs, this could increase uncertainty for Interconnector Users in respect of their previous trading positions. |
| **Code Objectives Furthered***(State the Code Objectives the Proposal furthers, see Section 1.3 of T&SC for Code Objectives)* |
| This Modification furthers the following Code Objectives:2. to facilitate the efficient, economic and coordinated operation, administration and development of the Single Electricity Market in a financially secure manner;3. to facilitate the participation of electricity undertakings engaged in the generation, supply or sale of electricity in the trading arrangements under the Single Electricity Market;4. to promote competition in the single electricity wholesale market on the island of Ireland;5. to provide transparency in the operation of the Single Electricity Market;  |
| **Implication of not implementing the Modification Proposal***(State the possible outcomes should the Modification Proposal not be implemented)* |
| If this Modification Proposal is not implemented, previously determined MIUNs may not be fixed where Excessive Area occurs as part of MIUN calculations. This would not be consistent with the principles of the Intra-Day Trading Design or the EU Congestion Management Guidelines. |
| **Working Group***(State if Working Group considered necessary to develop proposal)* | **Impacts***(Indicate the impacts on systems, resources, processes and/or procedures)* |
| Not required | MIUN Calculator |
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| ***Please return this form to Secretariat by email to*** ***modifications@sem-o.com*** |

**Notes on completing Modification Proposal Form:**

1. **If a person submits a Modification Proposal on behalf of another person, that person who proposes the material of the change should be identified on the Modification Proposal Form as the Modification Proposal Originator.**
2. **Any person raising a Modification Proposal shall ensure that their proposal is clear and substantiated with the appropriate detail including the way in which it furthers the Code Objectives to enable it to be fully considered by the Modifications Committee.**
3. **Each Modification Proposal will include a draft text of the proposed Modification to the Code unless, if raising a Provisional Modification Proposal whereby legal drafting text is not imperative.**
4. **For the purposes of this Modification Proposal Form, the following terms shall have the following meanings:**

**Agreed Procedure(s): means the detailed procedures to be followed by Parties in performing their obligations and functions under the Code as listed in Appendix D “List of Agreed Procedures”.**

**T&SC / Code: means the Trading and Settlement Code for the Single Electricity Market**

**Modification Proposal: means the proposal to modify the Code as set out in the attached form**

**Derivative Work: means any text or work which incorporates or contains all or part of the Modification Proposal or any adaptation, abridgement, expansion or other modification of the Modification Proposal**

**The terms “Market Operator”, “Modifications Committee” and “Regulatory Authorities” shall have the meanings assigned to those terms in the Code.**

**In consideration for the right to submit, and have the Modification Proposal assessed in accordance with the terms of Section 2 of the Code (and Agreed Procedure 12), which I have read and understand, I agree as follows:**

**1. I hereby grant a worldwide, perpetual, royalty-free, non-exclusive licence:**

* 1. **to the Market Operator and the Regulatory Authorities to publish and/or distribute the Modification Proposal for free and unrestricted access;**
	2. **to the Regulatory Authorities, the Modifications Committee and each member of the Modifications Committee to amend, adapt, combine, abridge, expand or otherwise modify the Modification Proposal at their sole discretion for the purpose of developing the Modification Proposal in accordance with the Code;**
	3. **to the Market Operator and the Regulatory Authorities to incorporate the Modification Proposal into the Code;**

**1.4 to all Parties to the Code and the Regulatory Authorities to use, reproduce and distribute the Modification Proposal, whether as part of the Code or otherwise, for any purpose arising out of or in connection with the Code.**

**2. The licences set out in clause 1 shall equally apply to any Derivative Works.**

**3. I hereby waive in favour of the Parties to the Code and the Regulatory Authorities any and all moral rights I may have arising out of or in connection with the Modification Proposal or any Derivative Works.**

**4. I hereby warrant that, except where expressly indicated otherwise, I am the owner of the copyright and any other intellectual property and proprietary rights in the Modification Proposal and, where not the owner, I have the requisite permissions to grant the rights set out in this form.**

**5. I hereby acknowledge that the Modification Proposal may be rejected by the Modifications Committee and/or the Regulatory Authorities and that there is no guarantee that my Modification Proposal will be incorporated into the Code.**