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| **MODIFICATION PROPOSAL FORM** |
| **Proposer** | **Date of receipt** | **Type of Proposal** | **Modification Proposal ID** |
| **SEMO** | **21 November 2012** | **Standard**  | **Mod\_28\_12** |
| **Contact Details for Modification Proposal Originator** |
| **Name** | **Telephone number** | **Email address** |
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| **Modification Proposal Title** |
| **Clarifications to Appendix N** |
| **Documents affected** | **Section(s) Affected** | **Version number of T&SC or AP used in Drafting** |
| **T&SC** | **Appendix N**  | **V12.0** |
| **Explanation of Proposed Change** |
| In Mod\_18\_10v2 Intra-Day Trading, changes were made to Appendix N to document the settings of Higher Operating Limit and Lower Operating Limit in tabular form. An inconsistency has been identified in Table N.2 which this modification proposes to correct.This modification also corrects a number of inconsistencies in Appendix N with regard to the use of Availability and Higher operating Limit. |
| **Legal Drafting Change***(Clearly show proposed code change using* ***tracked*** *changes, if proposer fails to identify changes, please indicate best estimate of potential changes)* |
| **Derivation of Single Ramp Up Rate*** 1. Each Price Maker Generator Unit that is not Under Test shall be represented in the MSP Software as having a Single Ramp Up Rate for the Optimisation Time Horizon that limits the rate at which its average MW Output can be scheduled to increase from one Trading Period to the next, to a value determined by the Market Operator as follows:
1. For each Price Maker Generator Unit that is not Under Test and is not a Demand Side Unit, Pumped Storage Unit or Interconnector Unit, the Single Ramp Up Rate, expressed in MW per Trading Period shall be calculated as follows:

 Where:1. Output Range, expressed in MW, shall be calculated as the Single Ramp Up Rate Upper Limit less the Single Ramp Up Rate Lower Limit

Where,if the maximum value of Higher Operating Limit (derived in accordance with Appendix N.37) that occurs in any Trading Period over the Optimisation Time Horizon is less than or equal to the value of Minimum Generation thenThe Single Ramp Up Rate Upper Limit shall be set equal to the value of Maximum Generation and the Single Ramp Up Rate Lower Limit shall be calculated as the greater of the minimum value of Lower Operating Limit that occurs in any Trading Period over the Optimisation Time Horizon and the value of Minimum Generation. Otherwise the Single Ramp Up Rate Upper Limit shall be calculated as the maximum value of Higher Operating Limit (derived in accordance with Appendix N.37) that occurs in any Trading Period over the Optimisation Time Horizon and the Single Ramp Up Rate Lower Limit shall be calculated as the greater of the minimum value of Lower Operating Limit that occurs in any Trading Period over the Optimisation Time Horizon and the value of Minimum Generation.1. Ramp Up Time, expressed in minutes, is the minimum time it would take that Generator Unit to increase its instantaneous Output from its Single Ramp Up Rate Lower Limit to its Single Ramp Up Rate Upper Limit calculated using Ramp Up Rate 1 to Ramp Up Rate 5 (to the extent that such values have been provided) and Ramp Up Break Point 1 to Ramp Up Break Point 4 (to the extent that such values have been provided). In determining Ramp Up Time, Ramp Up Rate i applies between a MW Output of Ramp Up Break Point i-1 and a MW Output of Ramp Up Break Point i, where if there is no defined Ramp Up Break Point i-1 then Ramp Up Rate i applies for all MW Output levels below Ramp Up Break Point i while if there is no defined Ramp Up Break Point i then Ramp Up Rate i applies for all MW Output levels above Ramp Up Break Point i-1, with the exception that if that the largest Ramp Up Break Point j value is less than the Maximum Higher Operating Limit of the unit over the day then Ramp Up Rate j applies between Ramp Up Break Point j-1 and the Maximum Higher Operating Limit of the Unit. If there are no Ramp Up Break Point values provided then Ramp Up Rate 1 applies for all levels of MW Output. For the avoidance of doubt, if Ramp Up Break Point j is the last valid Ramp Up Break Point provided (for j increasing from j=1), then no Ramp Up Rate n>j+1 or Ramp Up Break Point n>j is to be considered in the calculation of Ramp Up Time.
2. Dwell Time Up, expressed in minutes, is the sum of all Dwell Times Up corresponding to Dwell Time Up Trigger Points, between and including the Unit’s Single Ramp Up Rate Lower Limit and its Single Ramp Up Rate Upper Limit for that Optimisation Time Horizon; and
3. TPD is the Trading Period Duration.
4. For Generator Units that are Pumped Storage Units, the value of Single Ramp Up Rate, expressed in MW per Trading Period, shall be calculated as follows

 Where:1. Higher Operating Limit of the Generator Unit is derived in accordance with Appendix ;
2. Ramp Up Time, expressed in minutes, is the minimum time it would take that Generator Unit to increase its instantaneous Output from 0 MW to its Higher Operating Limit calculated using Ramp Up Rate 1 to Ramp Up Rate 5 (to the extent that such values have been provided) and Ramp Up Break Point 1 to Ramp Up Break Point 4 (to the extent that such values have been provided) and in accordance with the methodology in paragraph .1.b.
3. Dwell Time Up, expressed in minutes, is the sum of all Dwell Times Up corresponding to Dwell Time Up Trigger Points, between and including an Output of 0 MW and the Generator Unit’s Higher Operating Limit; and
4. TPD is the Trading Period Duration.
5. For Demand Side Units the Single Ramp Up Rate, expressed in MW per Trading Period, shall be the Accepted value of Maximum Ramp Up Rate multiplied by 60 x TPD, except that if a value for Maximum Ramp Up Rate that is greater than zero is not Accepted then the value for the Single Ramp Up Rate that is used within the MSP Software will be set by the Market Operator to a value which will impose no restrictions on the Market Schedule Quantity of the Demand Side Unit.
6. For Interconnector Units the Single Ramp Up Rate shall be set by the Market Operator to a value which will impose no restrictions on the Market Schedule Quantity of the Interconnector Unit.

Where the values of Higher Operating Limit for the relevant MSP Software Run Type are derived in accordance with paragraph N.37. **Derivation of Single Ramp Down Rate*** 1. Each Price Maker Generator Unit that is not Under Test shall be represented in the MSP Software as having a Single Ramp Down Rate for the Optimisation Time Horizon that limits the rate at which Generator Unit average MW Output can decrease from one Trading Period to the next with a value determined by the Market Operator as follows:
1. For each Price Maker Generator Unit that is not Under Test and is not a Demand Side Unit, Pumped Storage Unit, or Interconnector Unit, the Single Ramp Down Rate value for each Trading Period h in the Optimisation Time Horizon, expressed in MW per Trading Period, equals

Where:1. Output Range, expressed in MW, shall be calculated as the Single Ramp Down Rate Upper Limit less the Single Ramp Down Rate Lower Limit

Where,if the maximum value of Higher Operating Limit (derived in accordance with Appendix N.37) that occurs in any Trading Period over the Optimisation Time Horizon is less than or equal to the value of Minimum Generation thenthe Single Ramp Down Rate Upper Limit shall be calculated as the value of Maximum Generation and the Single Ramp Down Rate Lower Limit shall be calculated as the greater of the minimum value of Lower Operating Limit (derived in accordance with Appendix N.40) that occurs in any Trading Period over the Optimisation Time Horizon and the value of Minimum Generation. Otherwise the Single Ramp Down Rate Upper Limit shall be calculated as the maximum value of Higher Operating Limit (derived in accordance with Appendix N.37) that occurs in any Trading Period over the Optimisation Time Horizon and the Single Ramp Down Rate Lower Limit shall be calculated as the greater of the minimum value of Lower Operating Limit (derived in accordance with Appendix N.40) that occurs in any Trading Period over the Optimisation Time Horizon and the value of Minimum Generation.1. Ramp Down Time, expressed in minutes, is the minimum time it would take that Generator Unit to decrease its instantaneous Output from its Single Ramp Down Rate Upper Limit to its Single Ramp Down Rate Lower Limit calculated using Ramp Down Rate 1 to Ramp Down Rate 5 (to the extent that such values have been provided) and Ramp Down Breakpoint 1 to Ramp Down Break Point 4 (to the extent that such values have been provided). In determining Ramp Down Time, Ramp Down Rate i applies between a MW Output of Ramp Down Break Point i-1 and a MW Output of Ramp Down Break Point i, where if there is no defined Ramp Down Break Point i-1 then Ramp Down Rate i applies for all MW Output levels below Ramp Down Break Point i while if there is no defined Ramp Down Break Point i then Ramp Down Rate i applies for all MW Output levels above Ramp Down Break Point i-1, with the exception that if that the largest Ramp Down Break Point j value is less than the Maximum Higher Operating Limit of the unit over the day then Ramp Up Rate j applies between Ramp Up Break Point j and the Maximum Higher Operating Limit of the Unit. If there are no Ramp Down Break Point values provided then Ramp Down Rate 1 applies for all levels of MW Output. For the avoidance of doubt, if Ramp Down Break Point j is the last valid Ramp Down Break Point provided (for j increasing from j=1), then no Ramp Down Rate n>j+1 or Ramp Down Break Point n>j is to be considered in the calculation of Ramp Down Time.
2. Dwell Time Down, expressed in minutes, is the sum of all Dwell Times Down corresponding to Dwell Time Down Trigger Points, between and including the Unit’s Single Ramp Down Rate Lower Limit and its Single Ramp Down Rate Upper Limit; and
3. TPD is the Trading Period Duration.
4. For Generator Units that are Pumped Storage Units, the Single Ramp Down Rate, expressed in MW per Trading Period, shall be calculated as follows

Where:1. Higher Operating Limit of the Generator Unit is derived in accordance with Appendix N.37;
2. Ramp Down Time, expressed in minutes, is the minimum time it would take that Generator Unit to decrease its instantaneous Output from its Higher Operating Limit to 0 MW calculated using Ramp Down Rate 1 to Ramp Down Rate 5 (to the extent that such values have been provided) and Ramp Down Break Point 1 to Ramp Down Break Point 4 (to the extent that such values have been provided) and in accordance with the methodology in paragraph .1.b.
3. Dwell Time Down, expressed in minutes, is the sum of all Dwell Times Down corresponding to Dwell Time Down Triggers, between and including an Output of 0 MW and the Generator Unit’s Higher Operating Limit; and
4. TPD is the Trading Period Duration.
5. For Demand Side Units, the Single Ramp Down Rate, expressed in MW per Trading Period, shall be the Accepted value of Maximum Ramp Down Rate multiplied by 60 x TPD, except that if a value for Maximum Ramp Down Rate that is greater than zero is not Accepted then the value for the Single Ramp Down Rate that is used within the MSP Software will be set by the Market Operator to a value which will impose no restrictions on the Market Schedule Quantity of the Demand Side Unit.
6. For Interconnector Units the Single Ramp Down Rate shall be set to a value which will impose no restrictions on the Market Schedule Quantity of the Interconnector Unit.

**Derivation of Higher Operating Limit**N.37 For the purposes of each MSP Software Run, the values of Higher Operating Limit for each Trading Period h in the Optimisation Time Horizon for all Price Maker Generator Units u that are not Under Test shall be set in accordance with Table N.1:Table N.1 – Definition of Higher Operating Limit for MSP Software Runs

| MSP Software Run | Higher Operating Limit |
| --- | --- |
| Ex-Ante One MSP Software Run | * For Interconnector Units, set to be equal to the lesser of the Maximum Interconnector Unit Import Capacity and the Active Interconnector Unit Import Capacity Holding. If no Active Interconnector Unit Import Capacity Holding is available then a value of zero shall be used in its place.
* For Price Maker Generator Units u that are not Under Test, set to be equal to the Accepted Forecast Availability Profile values which are submitted as part of their Technical Offer Data within the EA1 Gate Window.
 |
| Ex-Ante Two MSP Software Run | * For Interconnector Units, set to be equal to the Maximum Interconnector Unit Import Capacity.
* For Price Maker Generator Units u that are not Under Test, set to be equal to the Accepted Forecast Availability Profile values which are submitted as part of their Technical Offer Data within the EA2 Gate Window.
 |
| Within Day One MSP Software Run | * For Interconnector Units, set to be equal to the Maximum Interconnector Unit Import Capacity.
* For Price Maker Generator Units u that are not Under Test, set to be equal to the Accepted Forecast Availability Profile values which are submitted as part of their Technical Offer Data within the WD1 Gate Window.
 |
| Ex-Post Indicative MSP Software Run | * For Interconnector Units, set to be equal to the value of Actual Availability for the corresponding MSP Software Run, as determined in accordance with paragraph 5.75.
* For Price Maker Generator Units u that are not Under Test, as follows:
	+ for each Trading Period h within the first 18 hours of the Optimisation Time Horizon, set to be equal to the Actual Availability (AAuh) values as calculated by the Market Operator in accordance with paragraphs 4.52 to 4.53 or within Section 5 as appropriate; and
	+ for each of the remaining Trading Periods h in the Optimisation Time Horizon, set to be equal to the value of Availability as determined above, for the last Trading Period h that is within the first 18 hours of that Optimisation Time Horizon.
 |
| Ex-Post Initial MSP Software Run | * For Interconnector Units, set to be equal to the value of Actual Availability for the corresponding MSP Software Run, as determined in accordance with paragraph 5.75.
* For Price Maker Generator Units u that are not Under Test, set to be equal to the Actual Availability (AAuh) values as calculated by the Market Operator in accordance with paragraphs 4.52 to 4.53 or within Section 5 as appropriate.
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**Derivation of Lower Operating Limit**N.40 For the purposes of each MSP Software Run, the values of Lower Operating Limit for each Trading Period h in the Optimisation Time Horizon for all Price Maker Generator Units u that are not Under Test shall be set by the Market Operator in accordance with Table N.2:**Table N.2 – Definition of Lower Operating Limit for MSP Software Runs**

| **MSP Software Run** | **Lower Operating Limit** |
| --- | --- |
| Ex-Ante One MSP Software Run | * For Interconnector Units, set to be equal to whichever is the smaller in absolute magnitude of the Maximum Interconnector Unit Export Capacity and the Active Interconnector Unit Export Capacity Holding. If no Active Interconnector Unit Export Capacity Holding is available then a value of zero shall be used in its place.
* For Pumped Storage Units, set to be equal to the Accepted Forecast Minimum Output Profile value submitted as part of their Technical Offer Data within the EA1 Gate Window.
* For all other Price Maker Generator Units u that are not Under Test, set to be equal to the Accepted Forecast Minimum Stable Generation Profile values which are submitted as part of their Technical Offer Data within the EA1 Gate Window.
 |
| Ex-Ante Two MSP Software Run | * For Interconnector Units, set to be equal to the Maximum Interconnector Unit Export Capacity.
* For Pumped Storage Units, set to be equal to the Accepted Forecast Minimum Output Profile value submitted as part of their Technical Offer Data within the EA2 Gate Window.
* For all other Price Maker Generator Units u that are not Under Test, set to be equal to the Accepted Forecast Minimum Stable Generation Profile values which are submitted as part of their Technical Offer Data within the EA2 Gate Window.
 |
| Within Day One MSP Software Run | * For Interconnector Units, set to be equal to the Maximum Interconnector Unit Export Capacity.
* For Pumped Storage Units, set to be equal to the Accepted Forecast Minimum Output Profile value submitted as part of their Technical Offer Data within the WD1 Gate Window.
* For all other Price Maker Generator Units u that are not Under Test, set to be equal to the Accepted Forecast Minimum Stable Generation Profile values which are submitted as part of their Technical Offer Data within the WD1 Gate Window.
 |
| Ex-Post Indicative MSP Software Run | * For Interconnector Units, set to be equal to the value of Minimum Output, as determined in accordance with paragraph 5.75, for the corresponding MSP Software Run.
* For each Pumped Storage Unit, set to be equal to the Minimum Output (MINOUTuh) as calculated by the Market Operator in accordance with paragraph 4.49.
* For all other Price Maker Generator Units u that are not Under Test, as follows:
	+ for each Trading Period h within the first 18 hours of the Optimisation Time Horizon, set to be equal to the Minimum Stable Generation (MINGENuh) values as calculated by the Market Operator in accordance with paragraphs 4.49 or within Section 5; and
	+ for each of the remaining Trading Periods h in the Optimisation Time Horizon, set to be equal to the value of Minimum Stable Generation as determined above for the last Trading Period h that is within the first 18 hours of that Optimisation Time Horizon.
 |
| Ex-Post Initial MSP Software Run | * For Interconnector Units, set to be equal to the value of Minimum Output for the corresponding MSP Software Run, as determined in accordance with paragraph 5.75.
* For each Pumped Storage Unit, set to be equal to the Minimum Output (MINOUTuh) as calculated by the Market Operator in accordance with paragraph 4.49
* For all other Price Maker Generator Units u that are not Under Test, set to be equal to the Minimum Stable Generation (MINGENuh) values as calculated by the Market Operator in accordance with paragraph 4.49 .
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| **Modification Proposal Justification***(Clearly state the reason for the Modification)* |
| In drafting Mod\_18\_10v2 and moving the existing information into tabular form, two inconsistencies were introduced into the drafting. This modification aims to rectify those. In addition, as the changes introduced from Mod\_42\_10v2 which became effective in V.12.0 of the T&SC were based on V7.0 of the T&SC, some of the references need to be updated. |
| **Code Objectives Furthered***(State the Code Objectives the Proposal furthers, see Section 1.3 of T&SC for Code Objectives)* |
| This modification aims to further This Modification Proposal aims to further Code Objective 1.3.5, namely::1.3.5 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 is not implemented, a lack of clarity will remain in Appendix N with regard to the setting of the Lower Operating Limit. |
| **Working Group***(State if Working Group considered necessary to develop proposal)* | **Impacts***(Indicate the impacts on systems, resources, processes and/or procedures)* |
| No | No system impacts.  |
| ***Please return this form to Secretariat by email to*** ***modifications@sem-o.com*** |