

EC4T Metering Rules

Explanatory Note

(A) These EC4T Metering Rules set out:

- (i) the process for collecting electricity consumption data and other related data from metering equipment installed on trains and supplying it to Network Rail; and
- (ii) the rules which shall apply where metered data is missing or not supplied to Network Rail within the prescribed time,

for the purposes of calculating the Traction Electricity Charge.

(B) This Explanatory Note does not form part of the EC4T Metering Rules.

1. Definitions and Interpretation

1.1 Unless otherwise defined in these EC4T Metering Rules or the context requires otherwise, words and expressions used in these EC4T Metering Rules shall have the meanings, constructions and interpretation ascribed to them in the Relevant Track Access Contract.

1.2 In these EC4T Metering Rules, unless the context otherwise requires:

“Act” has the meaning ascribed to it in Clause 1.1 of the Relevant Track Access Contract;

“Appendix Amendment Notice” means a notice given by ORR to Network Rail under either paragraph 17.6 or paragraph 17.7 which specifies amendments to Appendix 2 and/or Appendix 4 of these EC4T Metering Rules for any of the purposes set out in paragraphs 17.2(A) to 17.2(D) (inclusive);

“Consist Tonnage” means, in respect of a Journey, the weight (in tonnes) of the Specified Equipment for that Journey divided by the number of operating locomotives forming part of such Specified Equipment;

“Consultees” means all Metered Train Operators, all freight or regular scheduled passenger operators of trains using electric traction, and freight or regular scheduled passenger operators of trains that do not use electric traction who give notice to Network Rail that they are seeking either new track access contracts or amendments to existing track access contracts which will involve them using trains using electric traction;

“Consumption Data” means data in respect of the amount of electricity consumed (in kWh);

“Cost Reconciliation” means the process for the calculation and payment of the supplementary amount $S2_t$ set out in Schedule 7 of the train operator's track access contract;

“Data Record” means a record of either: (a) Consumption Data; (b) Regenerative Braking Data; or (c) GPS Data, as the case may be, in respect of each 5-minute period during a Journey or Non-Journey;

“EC4T Metering Audit” means the exercise by Network Rail, the Train Operator or any other train operator of any of its rights set out in paragraph 9.2, 9.10 or 9.19 respectively, as the case may be;

“Electricity Data” means Consumption Data and (where relevant) Regenerative Braking Data;

“Electricity Type (AC/DC)” means either the alternating current (AC), or the direct current system (DC) of electricity supplied through the electrification system;

“EMU Length” means the number of individual vehicles in the electric multiple unit;

“Geographic Area g” means the relevant geographic section of the Network as set out in Appendix 7B to Schedule 7 (in the case of passenger operators) or Appendix 1 to Schedule 7 (in the case of freight operators) of the Relevant Track Access Contract;

“GPS Data” means data in respect of geographical location;

“Gross Tonne Mile” or **“GTM”** has the meaning ascribed to it in Schedule 7 of the Relevant Track Access Contract;

“Infill Value” means the relevant value in respect of Consumption Data or Regenerative Braking Data, as the case may be, set out in the Journey Look-Up Tables or the value in respect of Consumption Data set out in the Non-Journey Look-Up Table, as the case may be;

“Journey” means a movement of Specified Equipment which has a designated headcode;

“Journey Look-Up Tables” means the tables containing Data Records in respect of Consumption Data and Regenerative Braking Data calculated or otherwise determined in accordance with paragraph 3, the templates for which are set out in Tables 1.1 and 1.2 respectively (in the case of passenger journeys) or Tables 1.3 and 1.4 respectively (in the case of freight and locomotive-hauled passenger journeys) in appendix 1;

“KGTM” means 1000 Gross Tonne Miles;

“Look-Up Tables” means the Journey Look-Up Tables and the Non-Journey Look-Up Table;

“Metered Charges” means, for the purposes of paragraph 9, the amounts E_{tme} , E_{tmuAC} and E_{tmuDC} which are calculated using metered consumption data in accordance with Schedule 7 of the Relevant Track Access Contract;

“Metered Data” means Electricity Data and GPS Data in respect of a train which has been collected from the train's On-Train Meter;

“Metered Train Operators” means all train operators whose track access contracts incorporate these EC4T Metering Rules, and any train operator who has notified Network Rail that it intends to amend its track access contract to calculate its traction electricity charge based on metered consumption data, so that its contract will incorporate these EC4T Metering Rules from the start of the next financial year;

“Modelled Train Operator” has the meaning given to it in paragraph 18.2;

“Net Infilled Electricity Data Value” means, in respect of a particular Period, the total value (in kWh) of Data Records for Consumption Data which have been substituted with Infill Values, less the total value (in kWh) of Data Records for Regenerative Braking Data which have been substituted with Infill Values;

“Network Rail Metering Data Interface Specification” means a document which shall be updated by Network Rail from time to time, in which Network Rail shall specify, in accordance with any applicable standards, the manner and format in which Metered Data shall be provided to it;

“Non-Journey” means a period during which the Specified Equipment is parked or laid up for maintenance or other purposes and is consuming electricity, in relation to which there is no designated headcode;

“Non-Journey Look-Up Table” means a table containing Consumption Data calculated or otherwise determined in accordance with paragraph 3, a template for which is set out in Table 2.1 in appendix 1;

“On-Train Meter” means a meter or other device or technology which measures a train’s actual consumption of electricity, geographic location and, where relevant, electricity generated by braking and **“On-Train Metering”** shall be construed accordingly;

“On-Train Metering Commencement Date” means the date from which Metered Data is first used to calculate all or part of the Train Operator’s Traction Electricity Charge;

“ORR” has the meaning ascribed to it in Clause 1.1 of the Relevant Track Access Contract;

“OTM Incentive Charge” means the additional amount payable by a Metered Train Operator to Network Rail as a consequence of paragraph 7.1 of these EC4T Metering Rules;

Deleted: Infill Values being increased pursuant to

“OTM Incentive Year” means the period of 13 consecutive Periods including and immediately preceding the relevant Trigger Period;

“Period” means each consecutive period of 28 days commencing at 0000 hours on 1 April in each year, provided that the length of the first and last such Period in any year may be varied by up to seven days on reasonable prior notice from Network Rail to the Train Operator;

“Power Factor Correction” has the meaning ascribed to it in Schedule 7 of the Relevant Track Access Contract;

“Prospective Metered Train Operator” means any person that has an application pending with ORR for approval of a track access contract which would incorporate these EC4T Metering Rules;

“Regenerative Braking Data” means data in respect of the amount of electricity (in kWh) generated by braking;

“Relevant Complaint” means a complaint by a Consultee about the consultation process, or a complaint by a Metered Train Operator about any part of the change procedure set out in paragraphs 11.1 to 11.16;

“Relevant Track Access Contract” means the track access contract into which these EC4T Metering Rules are incorporated;

“Relevant Year” means a year commencing at 0000 hours on 1 April and ending immediately before 0000 hours on the following 1 April; **“Relevant Year t”** means the Relevant Year for the purposes of which any calculation falls to be made; **“Relevant Year t-1”** means the Relevant Year preceding Relevant Year t; and similar expressions shall be construed accordingly;

“Relevant Year 2010/2011” means the year commencing at 0000 hours on 1 April 2010 and ending at 2359 hours on 31 March 2011;

“Specified Equipment” has the meaning ascribed to it in Clause 1.1 of the Relevant Track Access Contract;

“Tolerance Factor” has the meaning ascribed to it in Schedule 7 of the Relevant Track Access Contract;

“Total Net Electricity Data Value” means, in respect of a particular Period, the total value (in kWh) of Data Records for Consumption Data (derived from both Metered Data and Infill Values) less the total value (in kWh) of Data Records for Regenerative Braking Data (derived from both Metered Data and Infill Values);

“Traction Electricity Charge” has the meaning ascribed to it in Schedule 7 of the Relevant Track Access Contract, or as the case may be, Schedule 7 of the track access contract of the Modelled Train Operator;

“Traction Electricity Consumption Rates List” has the meaning ascribed to it in Schedule 7 of the Relevant Track Access Contract;

“Traction Electricity Rate” has the meaning given to it in Schedule 7 of the Modelled Train Operator’s track access contract;

“Train Mile” has the meaning ascribed to it in Schedule 7 of the Relevant Track Access Contract

“Train Service Code” (in the case of passenger operators) has the meaning ascribed to it in paragraph 1.1 of Schedule 5 of the Relevant Track Access Contract, (in the case of freight operators) means the eight character code used to identify Services (“Services” is defined in Clause 1.1 of the Relevant Track Access Contract);

“Trigger Period” has the meaning given to it in paragraph 7.1 of these EC4T Metering Rules;

“Vehicle Mile” (in the case of passenger operators) has the meaning ascribed to it in paragraph 1 of Part 1 of Schedule 7 of the Relevant Track Access Contract;

“Volume Reconciliation” means the process for the calculation and payment of the supplementary amount $S1_t$ or S_t (as the case may be) set out in Schedule 7 of the train operator’s track access contract;

“Working Days” has the meaning ascribed to it in Clause 1.1 of the Relevant Track Access Contract.

1.3 In these EC4T Metering Rules, unless the context otherwise requires:

(A) These EC4T Metering Rules

References to these EC4T Metering Rules mean these EC4T Metering Rules as modified from time to time.

(B) Appendices and paragraphs

References to appendices and paragraphs are to appendices and paragraphs of these EC4T Metering Rules.

(C) Definitions in the Act

Terms and expressions defined in the Act shall, unless the contrary intention appears, have the same meaning in these EC4T Metering Rules.

(D) Statutory provisions

References to statutory provisions shall be construed as references to those provisions as amended or re-enacted or as their application is modified by other statutory provisions from time to time and shall include references to any statutory provisions of which they are re-enactments (whether with or without modification).

(E) Interpretation Act

Words and expressions defined in the Interpretation Act 1978 shall have the same meaning in these EC4T Metering Rules and the rules of interpretation contained in that Act shall apply to the interpretation of these EC4T Metering Rules.

(F) Include

The words “include” and “including” are to be construed without limitation.

(G) Other documents etc.

Any agreement, instrument, licence, standard, timetable, code or other document referred to in these EC4T Metering Rules or entered into, approved, authorised, accepted or issued by a person pursuant to these EC4T Metering Rules shall be construed, at the particular time, as a reference to that agreement, instrument, licence, standard, timetable, code or other document, as it may then have been amended, varied, supplemented or novated.

(H) Conflict

In the event of any conflict of interpretation between these EC4T Metering Rules and an Access Agreement (not including these EC4T Metering Rules) the following order of precedence shall apply:

- (1) these EC4T Metering Rules; and
- (2) the Access Agreement.

(I) Time limits

Where in these EC4T Metering Rules any obligation of a party is required to be performed within a specified time limit that obligation shall continue after that time limit if the party fails to comply with that obligation within the time limit.

(J) Headings

The headings and references to headings shall be disregarded in construing these EC4T Metering Rules.

(K) Ruling language

All notices served under these EC4T Metering Rules shall be in the English language.

2. Application of these EC4T Metering Rules

- 2.1 The Train Operator shall ensure that its On-Train Meters comply with all relevant industry standards (to the extent that such standards are applicable to the Train Operator).
- 2.2 The Train Operator shall collect Metered Data from all of its On-Train Meters and shall provide such data to Network Rail in accordance with the Network Rail Metering Data Interface Specification (or as otherwise agreed between the Train Operator and Network Rail), within 7 (seven) days of the day on which such data was generated.
- 2.3 In the event that any Data Records are missing from the Metered Data collected by the Train Operator, Network Rail shall provide data calculated in accordance with paragraphs 4, 5 or 6 (as the case may be) in place of such missing Data Records.

- 2.4 In the event that the Train Operator fails to provide any Metered Data to Network Rail within the 7 (seven) day period referred to in paragraph 2.2, the provisions of paragraphs 4.2 and 5.2 as applicable, shall apply for the purposes of calculating that part of the Traction Electricity Charge relating to such data.
- 2.5 The Train Operator shall use reasonable endeavours to notify Network Rail as soon as reasonably practicable of any changes to information relating to its vehicles (including but not limited to vehicle IDs) which Network Rail requires for the purposes of calculating that part of the Traction Electricity Charge based on Metered Data (or Infill Values).
- 2.6 For the Relevant Year 2010/2011 only, these EC4T Metering Rules shall apply as amended in accordance with appendix 5.
- 2.7 The Train Operator acknowledges that for the purposes of calculating the Traction Electricity Charge, it shall only be charged based on Metered Data in respect of those categories of metered trains specified in Appendix 7D of Part 2 of Schedule 7 (in the case of passenger operators) or Appendix 2 of Schedule 7 (in the case of freight operators) of the Relevant Track Access Contract, in accordance with the provisions of the Relevant Track Access Contract once Network Rail confirms that data-flow and billing system tests have been completed successfully.

Deleted: .

Formatted: Font: Not Italic

Formatted: Font: Not Bold, Not Italic

3. Look-Up Tables

Journeys

- 3.1 Network Rail shall create and maintain Journey Look-Up Tables for each Metered Train Operator.
- 3.2 Subject to paragraphs 3.3 and 3.9:
- (A) in the case of non locomotive-hauled passenger journeys, in relation to each Journey for a particular Train Service Code, Specified Equipment, Geographic Area, Electricity Type (AC/DC), EMU Length and number of units, the Journey Look-Up Tables shall include the mean value of:
- (1) Consumption Data per 5-minute period; and
 - (2) where relevant, Regenerative Braking Data per 5-minute period,
- which shall be calculated using Metered Data for the previous Period; or
- (B) in the case of freight and locomotive-hauled passenger journeys, in relation to each Journey for a particular Train Service Group, Specified Equipment, Geographic Area, Electricity Type (AC/DC) and number of units, the Journey Look-Up Tables shall include the mean value of:
- (1) Consumption Data per 5-minute period per tonne; and
 - (2) where relevant, Regenerative Braking Data per 5-minute period per tonne,

which shall be calculated using Metered Data for the previous Period.

- 3.3 If, in Network Rail's reasonable opinion, there is insufficient Metered Data for a particular Period to update the Journey Look-Up Table in accordance with paragraph 3.2, then Network Rail and the Train Operator shall seek to agree the values to be included in the Journey Look-Up Table. If the parties are unable to agree within 7 (seven) days after the start of the relevant Period then Network Rail shall determine (acting reasonably) the values to be included in the Journey Look-Up Table for that Period.

Non-Journeys

- 3.4 Network Rail shall create and maintain a Non-Journey Look-Up Table for each Metered Train Operator.
- 3.5 Subject to paragraphs 3.6 and 3.9, in relation to Non-Journeys in each Geographic Area for particular Specified Equipment and Electricity Type (AC/DC), the Non-Journey Look-Up Table shall include the mean value of Consumption Data per 5-minute period of each relevant Non-Journey, which shall be calculated using Metered Data for the previous Period.
- 3.6 If, in Network Rail's reasonable opinion, there is insufficient Metered Data for a particular Period to update the Non-Journey Look-Up Table in accordance with paragraph 3.5, then Network Rail and the Train Operator shall seek to agree the values to be included in the Non-Journey Look-Up Table. If the parties are unable to agree within 7 (seven) days after the start of the relevant Period then Network Rail shall determine (acting reasonably) the values to be included in the Non-Journey Look-Up Table for that Period.

General

- 3.7 Network Rail shall update the Look-Up Tables as soon as reasonably practicable after the start of each Period. The form of the Look-Up Tables shall be as set out in appendix 1, unless otherwise agreed between the parties.
- 3.8 ORR approval shall not be required for the creation or updating of the Look-Up Tables.
- 3.9 Unless sufficient relevant Metered Data is available in Network Rail's reasonable opinion, the Journey Look-Up Tables and the Non-Journey Look-Up Tables for the first Period and any subsequent consecutive Period following the On-Train Metering Commencement Date for a particular train category shall be created using the calibrated modelled consumption rates shown in the Traction Electricity Consumption Rates List and, where relevant, the regenerative braking discounts shown in Table 19.10 of the Periodic review 2008 - Determination of Network Rail's outputs and funding for 2009-14 published by the ORR.
- 3.10 In addition to any other rights of the Metered Train Operator, whether contained in the Relevant Track Access Contract or otherwise, copies of the Metered Train Operator's current Look-Up Tables shall be made available by Network Rail to such Metered Train Operator upon request by the Metered Train Operator at all reasonable times.

4. Missing Data Records (Electricity Data) for Journeys

- 4.1 If, in respect of a Journey, any Data Record in relation to either Consumption Data or Regenerative Braking Data is missing from the Metered Data, the missing Data Record shall be substituted with the relevant Infill Value contained in the Journey Look-Up Tables and (in the case of freight and locomotive-hauled passenger journeys only) multiplied by the Consist Tonnage.
- 4.2 If, in respect of a Journey, Metered Data in respect of Electricity Data is not provided by the Train Operator to Network Rail within 7 days (pursuant to paragraph 2.2 above), the missing Data Records for Consumption Data and Regenerative Braking Data shall be substituted with the relevant Infill Values contained in the Journey Look-Up Tables and (in the case of freight and locomotive-hauled passenger journeys only) multiplied by the Consist Tonnage.

5. Missing Data Records (Electricity Data) Non-Journeys

- 5.1 If, in respect of a Non-Journey, any Data Record in relation to either Consumption Data or Regenerative Braking Data is missing from the Metered Data, the missing Data Record shall be substituted with the relevant Infill Value contained in the Non-Journey Look-Up Table.
- 5.2 If, in respect of a Non-Journey, Metered Data in respect of Consumption Data and Regenerative Braking Data is not provided by the Train Operator to Network Rail within 7 days (pursuant to paragraph 2.2 above), the missing Data Records shall be substituted with the relevant Infill Values contained in the Non-Journey Look-Up Table.

6. Missing GPS Data

- 6.1 If, in respect of a Journey, any Data Record is missing from the GPS Data, the missing Data Record shall be interpolated as appropriate using the actual recorded GPS Data.

7. Consequences of use of Infill Values above threshold

- 7.1 If, in any Period following the On-Train Metering Commencement Date, the Net Infilled Electricity Data Value expressed as a percentage of the Total Net Electricity Data Value is greater than the percentage shown in Table 7.1: Threshold Percentage table, the OTM Incentive Charge for such Period (the "Trigger Period") shall be as follows:

Deleted: If:

(1) in the first Trigger Period in any OTM Incentive Year, the OTM Incentive Charge shall be 5% of the Metered Charges for Infilled Values

(2) in the second or any further Trigger Period in any OTM Incentive Year, the OTM Incentive Charge shall be 10% of the Metered Charges for Infilled Values"

Table 7.1: Threshold percentage table

Period Since On-Train Metering Commencement Date				
Periods 1-3	Periods 4-6	Periods 7-9	Periods 10-13	All later Periods
30%	25%	20%	15%	10%

- 7.2 Network Rail shall pay to each metered operator which consumes traction electricity a portion of the total amount of all OTM Incentive Charges received by Network Rail from Metered Train Operators pursuant to paragraph 7.1 in each Relevant Year for such train operator for that Relevant Year, calculated in accordance with the following formula:

$$PTO_t = \frac{A_t \times TIC_t}{B_t}$$

where:

- “P_{TOT}” means the proportional amount of OTM Incentive Charges payable to the train operator for Relevant Year t;
- “A_t” means the amount of the train operator's metered Traction Electricity Charge (where relevant, following the Cost Reconciliation) in Relevant Year t;
- “B_t” means the total amount of metered Traction Electricity Charges (where relevant, following the Cost Reconciliation) for all train operators in Relevant Year t;
- “TIC_t” means the total OTM Incentive Charges received by Network Rail from all Metered Train Operators pursuant to paragraph 7.1 in Relevant Year t.

8. **Not Used**

9. **EC4T Metering Audit**

Network Rail EC4T Metering Audit

- 9.1 The Train Operator shall, for a period of not less than two years, keep all data supplied by or on behalf of the Train Operator to Network Rail pursuant to these EC4T Metering Rules and all data used in or relating to the collection or creation of such data, and all material information relating to the supply, collection or creation of such data.
- 9.2 In addition to any other rights of Network Rail, including without limitation any rights set out in these EC4T Metering Rules or in any other provisions of the Relevant Track Access Contract and subject to paragraph 9.8, Network Rail may, at Network Rail's cost and expense upon giving not less than 5 (five) Working Days prior notice to the Train Operator, but no more than once in any Relevant Year:

Deleted: <#>in any of the first three Periods following the On-Train Metering Commencement Date, the Net Infilled Electricity Data Value is greater than 30% of the Total Net Electricity Data Value; or¶
<#>in any other Period, the Net Infilled Electricity Data Value is greater than 10% of the Total Net Electricity Data Value.¶
<#>the Net Infilled Electricity Data Value for such Period (the “Trigger Period”) shall be amended as follows:¶
<#>(1) in the first Trigger Period in any OTM Incentive Year, the Net Infilled Electricity Data Value shall be increased by 5%; and ¶
<#>(2) in the second or any further Trigger Period in any OTM Incentive Year, the Net Infilled Electricity Data Value shall be increased by 10%.¶
<#>Where the Net Infilled Electricity Data Value has been increased pursuant to paragraph 7.1, such increased value shall be used in the calculation of the Traction Electricity Charge for such Period. ¶

Formatted: Bullets and Numbering

Deleted: train

Deleted: P_{TOT} = $\frac{A_t}{B_t} \times TIC_t$ ¶
B_t¶

- (A) audit and inspect and take copies of such books, documents, data and other information (whether stored electronically or otherwise);
- (B) question such employees of the Train Operator and any of its agents, contractors, sub-contractors and consultants; and
- (C) inspect and/or test any On-Train Meters,

as Network Rail may reasonably require to verify the accuracy of the data supplied to it by the Train Operator pursuant to these EC4T Metering Rules. Where the Train Operator is party to more than one Relevant Track Access Contract, Network Rail shall, if it wishes to exercise its rights to carry out an EC4T Metering Audit in respect of more than one Relevant Track Access Contract, exercise such rights simultaneously and not separately during any Relevant Year.

- 9.3 The Train Operator shall, at Network Rail's cost and expense (subject to paragraph 9.8), procure that its agents, contractors, sub-contractors and consultants shall provide such access to Network Rail as is reasonably necessary for the purposes of the EC4T Metering Audit.
- 9.4 If, following an EC4T Metering Audit carried out by Network Rail, any data is found by Network Rail to be materially inaccurate, Network Rail shall notify the Train Operator in writing and shall provide evidence (in a reasonable level of detail) of such inaccuracy.
- 9.5 The Train Operator shall be entitled, within 14 days following receipt by the Train Operator of notice from Network Rail pursuant to paragraph 9.4, to notify Network Rail in writing that it objects to the findings of Network Rail's EC4T Metering Audit. Any such notice shall specify in reasonable detail the reasons for such objection and what the Train Operator believes to be the accurate data ("**notice of objection**"). In the absence of any notice of objection being served within such time the findings of Network Rail's EC4T Metering Audit shall be deemed to be accepted by the Train Operator and shall be final and binding on the parties.
- 9.6 The parties shall seek to agree the details specified in any notice of objection and any consequential financial adjustment required. If the parties are unable to agree within 28 days following receipt of a notice of objection, the matter shall be determined at the request of either party by arbitration in accordance with Chapter F of the Access Dispute Resolution Rules save that:
 - (A) the parties shall use their respective endeavours to ensure a joint paper setting out their respective positions on the matter in dispute is agreed for delivery to the arbitrator no later than 14 days following the expiration of a period of 28 days following receipt of a notice of objection;
 - (B) the parties shall each request that the arbitrator's decision in writing (following any discussions or meetings between or with the parties that the arbitrator considers necessary) is delivered to the parties within 56 days of his appointment and that the arbitrator establish such rules and procedures for the conduct of the arbitration as he sees fit having regard to such timescale; and

- (C) each of the parties shall accept and abide by the rules and procedures established by the arbitrator under paragraph 9.6(B).
- 9.7 Any consequential financial adjustment which is required to be made to any amounts paid or payable by the Train Operator or any other train operator pursuant to paragraph 9.4 or 9.6 shall be made through the Volume Reconciliation carried out in respect of the Relevant Year in which such amounts were paid or payable.
- 9.8 Where any data supplied by the Train Operator to Network Rail pursuant to these EC4T Metering Rules is shown as a result of an EC4T Metering Audit carried out by Network Rail to be inaccurate in any material respect, the Train Operator shall bear the reasonable costs of the EC4T Metering Audit.

Train Operator EC4T Metering Audit

- 9.9 Network Rail shall, for a period of not less than two years, keep all data used in or relating to the calculation of the Metered Charges.
- 9.10 In addition to any other rights of the Train Operator, including without limitation any rights set out in these EC4T Metering Rules or in any other provisions of the Relevant Track Access Contract and subject to paragraph 9.16, the Train Operator may, at the Train Operator's cost and expense, upon giving not less than 5 (five) Working Days prior notice to Network Rail, but no more than once in any Relevant Year:
 - (A) audit and inspect and take copies of such books, documents, data and other information (whether stored electronically or otherwise);
 - (B) question such employees of Network Rail and any of its agents, contractors, sub-contractors and consultants; and
 - (C) inspect and/or test any model or other application used by Network Rail in the calculation of the Metered Charges,

as the Train Operator may reasonably require to verify the accuracy of the Metered Charges. Where the Train Operator is party to more than one Relevant Track Access Contract, the Train Operator shall, if it wishes to exercise its rights to carry out an EC4T Metering Audit in respect of more than one Relevant Track Access Contract, exercise such rights simultaneously and not separately during any Relevant Year.

- 9.11 Network Rail shall, at the Train Operator's cost and expense (subject to paragraph 9.16), procure that its agents, contractors, sub-contractors and consultants shall provide such access to the Train Operator as is reasonable for the purposes of the EC4T Metering Audit.
- 9.12 If following an EC4T Metering Audit carried out by the Train Operator any Metered Charges are found by the Train Operator to be materially inaccurate, the Train Operator shall notify Network Rail in writing and shall provide evidence (in a reasonable level of detail) of such inaccuracy.
- 9.13 Network Rail shall be entitled within 14 days following receipt by Network Rail of notice from the Train Operator pursuant to paragraph 9.12, to notify the Train

Operator in writing that it objects to the findings of the Train Operator's EC4T Metering Audit. Any such notice shall specify in reasonable detail the reasons for such objection and what Network Rail believes to be the relevant charges for purposes of such EC4T Metering Audit ("**notice of objection**"). In the absence of any notice of objection being served within such time the findings of the Train Operator's EC4T Metering Audit shall be deemed to be accepted by Network Rail and shall be final and binding on the parties.

- 9.14 The parties shall seek to agree the details specified in any notice of objection and any consequential financial adjustment required. If the parties are unable to agree such charges within 28 days following receipt of a notice of objection, the matter shall be determined at the request of either party by arbitration in accordance with Chapter F of the Access Dispute Resolution Rules save that:
- (A) the parties shall use their respective endeavours to ensure a joint paper setting out their respective positions on the matter in dispute is agreed for delivery to the arbitrator no later than 14 days following the expiration of a period of 28 days following receipt of a notice of objection;
 - (B) the parties shall each request that the arbitrator's decision in writing (following any discussions or meetings between or with the parties that the arbitrator considers necessary) is delivered to the parties within 56 days of his appointment and that the arbitrator establish such rules and procedures for the conduct of the arbitration as he sees fit having regard to such timescale; and
 - (C) each of the parties shall accept and abide by the rules and procedures established by the arbitrator under paragraph 9.14(B).
- 9.15 Any consequential financial adjustment which is required to be made to any amounts paid or payable by the Train Operator or any other train operator pursuant to paragraph 9.12 or 9.14 shall be made through the Volume Reconciliation carried out within 90 days after the end of the Relevant Year in which such amounts were paid or payable.
- 9.16 Where any Metered Charges are shown as a result of an EC4T Metering Audit carried out by the Train Operator to be inaccurate in any material respect, Network Rail shall bear the reasonable costs of the EC4T Metering Audit.

Additional EC4T Metering Audits by Network Rail or the Train Operator

- 9.17 Neither Network Rail nor the Train Operator shall be entitled to carry out more than one EC4T Metering Audit of one another in any Relevant Year, without the prior written consent of ORR. If either party wishes to carry out more than one EC4T Metering Audit of one another in any Relevant Year, such party shall notify ORR in writing, providing reasons why it considers that an additional EC4T Metering Audit is required.
- 9.18 If ORR consents to either party carrying out more than one EC4T Metering Audit in any Relevant Year, any such additional EC4T Metering Audit shall be carried out by either Network Rail in accordance with the procedure set out in paragraphs 9.2 to 9.8 (inclusive) or by the Train Operator in accordance with the procedure set out in paragraphs 9.9 to 9.16 (inclusive) (as the case may

be), with such provisions being deemed to apply with such changes as are necessary in order to give effect to this paragraph 9.18.

EC4T Metering Audit requests by third party train operators

- 9.19 Any train operator may submit a request to ORR for an EC4T Metering Audit to be carried out in respect of any other train operator who is party to a Relevant Track Access Contract. Such request shall be in writing and shall specify the reasons why the train operator considers that an EC4T Metering Audit is necessary.
- 9.20 If ORR consents to such request, such EC4T Metering Audit shall be carried out by Network Rail on behalf of such train operator in accordance with the procedure set out in paragraphs 9.2 to 9.7 (inclusive), with such provisions being deemed to apply with such changes as are necessary in order to give effect to this paragraph 9.20.
- 9.21 Where any data supplied by a train operator to Network Rail pursuant to these EC4T Metering Rules is shown as a result of such an EC4T Metering Audit to be inaccurate in any material respect, the train operator who is the subject of the EC4T Metering Audit shall bear the reasonable costs of the EC4T Metering Audit and in all other cases such costs shall be borne by the train operator who requested the EC4T Metering Audit.

Time for completion of an EC4T Metering Audit

- 9.22 Any EC4T Metering Audit (including the resolution of any dispute arising out of such EC4T Metering Audit in accordance with paragraph 9.6 or 9.14) shall be concluded no later than 28 days after the end of the Relevant Year in which the EC4T Metering Audit was commenced. If any dispute arising out of such EC4T Metering Audit is not resolved within such time the findings of such EC4T Metering Audit shall be final and binding on the parties.

10. Data to be published by Network Rail

- 10.1 Within 14 (fourteen) days following the end of each Period, Network Rail shall publish the following data in respect of each Metered Train Operator:
- (A) the Total Net Electricity Data Value for such Period; and
 - (B) the Net Infilled Electricity Data Value for such Period expressed as a percentage of the Total Net Electricity Data Value for such Period.

11. Changes to these EC4T Metering Rules

Entitlement to make Proposed Metering Rules Change

- 11.1 Any Metered Train Operator, Network Rail or ORR (the “**Proposing Party**”) shall be entitled to make a proposal to change the EC4T Metering Rules (a “**Proposed Metering Rules Change**”).
- 11.2 Any such proposal shall:

- (A) be sent to Network Rail (except where Network Rail is the Proposing Party);
- (B) be in writing;
- (C) specify the wording of the Proposed Metering Rules Change and the date or series of dates on which it is proposed that it come into effect, if other than the period of 14 days after any approval notified by ORR pursuant to paragraph 11.16 below; and
- (D) be supported by an explanation in reasonable detail of the reasons for the Proposed Metering Rules Change.

Notice of Proposed Metering Rules Change

- 11.3 Network Rail shall, within 7 days following receipt of a Proposed Metering Rules Change, or, if later, within 7 days following receipt of any clarification that Network Rail may reasonably request from the Proposing Party:
- (A) give notice of that Proposed Metering Rules Change to the Consultees and ORR, as applicable, unless any such person has notified Network Rail that it does not wish to receive notice of a Proposed Metering Rules Change; and
 - (B) invite the submission to Network Rail of written representations in respect of that proposal within such period as is reasonable in all the circumstances (the “**Consultation Period**”), being a period of not less than 28 days from the date of notification under paragraph (A) above. Network Rail may make a written representation if it considers it appropriate to do so.
- 11.4 The Proposing Party shall promptly comply with all reasonable written requests of Network Rail for further clarification of the Proposed Metering Rules Change.
- 11.5 Network Rail shall, within 7 days of the end of the Consultation Period, publish all written representations received in accordance with paragraph 11.3(B) above on its website, and shall send copies of the same to the Proposing Party.
- 11.6 The Proposing Party shall consider all written representations received from Network Rail in accordance with paragraph 11.5 above. If and to the extent the Proposing Party considers it appropriate, it shall modify its Proposed Metering Rules Change to take account of such representations in accordance with paragraph 11.7 below. If the Proposing Party considers that no modification is required, the Proposed Metering Rules Change shall be put to a vote in accordance with paragraph 11.9 below.
- 11.7 If the Proposing Party makes any modifications to its original Proposed Metering Rules Change, together with Network Rail it shall take appropriate action as follows:
- (A) if either of the Proposing Party or Network Rail consider that the modification is material, the Proposing Party shall provide Network Rail with the modified Proposed Metering Rules Change in writing, and the provisions of paragraphs 11.1 to 11.6 inclusive shall apply as if set out

again in full, save that the Consultation Period in respect of the modified Proposed Metering Rules Change (the “**Re-Consultation Period**”) shall be 21 days (or longer if the Proposing Party so elects); or

- (B) if both the Proposing Party and Network Rail consider that the modification is immaterial, the modified proposal shall be put to a vote in accordance with paragraph 11.9 below.

11.8 If the Proposing Party considers it appropriate to make further modifications to the Proposed Metering Rules Change after the Re-Consultation Period, paragraph 11.7 shall apply again, and this process shall continue until no further material modifications are made, at which point the modified Proposed Metering Rules Change shall be put to a vote in accordance with paragraph 11.9 below.

Voting on a Proposed Metering Rules Change

11.9 Network Rail shall promptly arrange for a vote to take place on whether the Proposed Metering Rules Change is accepted or not, as follows:

- (A) the vote shall be open to the Metered Train Operators and Network Rail, who shall each cast one vote either for or against each Proposed Metering Rules Change, as they consider appropriate;
- (B) Network Rail shall specify a period for casting a vote, which shall be open for voting for not less than 7 days; and
- (C) the vote shall be conducted by e-mail.

11.10 A Proposed Metering Rules Change shall have been endorsed only if a majority of the votes cast are in favour of the relevant Proposed Metering Rules Change, provided that the failure of a party timeously to vote or a party intimating its abstention shall be treated as abstentions and not be included in the counting of votes to ascertain whether the Proposed Metering Rules Change has been endorsed or rejected.

11.11 If the vote taken in accordance with paragraph 11.9 above endorses the Proposed Metering Rules Change, Network Rail shall as soon as reasonably practicable submit the proposal to ORR in accordance with paragraph 11.13 below.

11.12 If the vote taken in accordance with paragraph 11.9 above rejects the Proposed Metering Rules Change, Network Rail shall as soon as reasonably practicable notify the Proposing Party of that decision.

ORR consent

11.13 When submitting an endorsed proposal to ORR in accordance with paragraph 11.11 above, Network Rail shall include a written memorandum:

- (A) containing details of the results of the consultation process (including copies of all representations made pursuant to paragraph 11.3(B) above, and any responses the Proposing Party may have made to the same);

- (B) stating the results of the vote conducted pursuant to paragraph 11.9 above (including identifying how each relevant party voted); and
- (C) stating the date or series of dates upon which it is considered that the proposal is to take effect, the first date being no earlier than 14 days after the date on which ORR consents to the proposal.

11.14 The Consultees and Network Rail shall use their respective reasonable endeavours to provide any further information required in relation to the consideration of a Proposed Metering Rules Change by ORR.

11.15 No Proposed Metering Rules Change shall have effect unless ORR gives notice to Network Rail in writing that it consents to the proposal. As part of its consent process, ORR may have regard to whether modifications made to the Proposed Metering Rules Change and classed as immaterial in accordance with paragraph 11.7(B) above should in fact have been classed as material (and therefore should have been subject to a re-consultation).

11.16 If ORR consents to the proposed change Network Rail shall ensure that all Consultees shall be notified within 7 days of ORR's consent of the change and its effective date. Unless ORR otherwise determines, the effective date shall be 14 days from the date of the notification given by Network Rail pursuant to this paragraph 11.16.

Procedural Irregularities

11.17 If before the effective date or dates of any change (as notified under paragraph 11.16 above) a Relevant Complaint is made to ORR concerning a failure to comply with any part of the procedure relating to the relevant Proposed Metering Rules Change, paragraph 11.18 shall apply.

11.18 In considering any Relevant Complaint, it shall be open to ORR to determine either that:

- (A) the change should become effective on the date notified under paragraph 11.16 above or any alternative date ORR considers appropriate in the circumstances; or
- (B) the change should not become effective on the date notified under paragraph 11.16 above and to the extent ORR considers appropriate the rules change process in paragraphs 11.1 to 11.12 above shall be re-run.

11.19 A change in respect of which a complaint has been made under paragraph 11.17 above shall not become effective unless ORR makes a determination under paragraph 11.18(A) above.

11.20 If a complaint is made to ORR concerning a failure to comply with any part of the procedure relating to a Proposed Metering Rules Change after the effective date or dates of any change, such change will remain in full force and effect as though no complaint had been made.

Modification of the EC4T Metering Rules by ORR

- 11.21 A modification made by ORR in accordance with paragraphs 11.22 to 11.27 below, does not need to be proposed in accordance with paragraphs 11.1 to 11.4 above.
- 11.22 The EC4T Metering Rules shall have effect with the modifications specified in any notice given by ORR for the purposes of these paragraphs 11.22 to 11.27 ("**modification notice**"), provided that:
- (A) ORR shall be satisfied as to the need for the modification as provided in paragraph 11.23 below;
 - (B) the procedural requirements of paragraph 11.25 below shall have been satisfied; and
 - (C) the modification shall not have effect until the date provided for in paragraph 11.26 below.
- 11.23 Subject to paragraph 11.24 below, a notice given by ORR under paragraph 11.22 above shall have effect if it is satisfied on reasonable grounds that either or both of the following conditions has been satisfied:
- (A) the modification in question is or is likely to be reasonably required in order to promote or achieve the objectives specified in section 4 of the Act; and/or
 - (B) the interests of any relevant person would be unfairly prejudiced if the modification in question were not made, and the need to avoid or remedy such unfair prejudice outweighs or is likely to outweigh any prejudice which will or is likely to be sustained by any other relevant person or persons if the modification is made, having due regard to the need to enable relevant persons to plan the future of their businesses with a reasonable degree of assurance.
- 11.24 ORR may give a notice under paragraph 11.22 above without the conditions in paragraph 11.23 being satisfied where the modification which is the subject of ORR's notice relates to an amendment to paragraphs 11.1 to 11.20 above and is necessary, in the opinion of ORR, to remedy an inefficiency in the change process contained within those paragraphs.
- 11.25 The procedural requirements which require to have been followed for the purposes of paragraph 11.22 above are:
- (A) in its consideration of the matters referred to in paragraph 11.23 above, ORR shall have consulted Network Rail and the Consultees together with any other persons which ORR considers ought properly to be consulted, in relation to the modification which it proposes to make;
 - (B) in the consultations referred to in paragraph 11.25(A) ORR have made available to each person so consulted such drafts of the proposed modification as it shall consider are necessary so as properly to inform such persons of the detail of the proposed modification;
 - (C) ORR shall have given each person so consulted the opportunity to make representations in relation to the proposed modification and shall have

taken into account all such representations received within the time specified by ORR for such consultation (other than those which are frivolous or trivial) in making its decision on the modification to be made;

- (D) ORR shall have notified each person consulted pursuant to paragraph 11.25(A) as to its conclusions in relation to the modification in question (including by providing to each such person a copy of the text of the proposed modification) and its reasons for those conclusions; and
 - (E) in effecting the notifications required by paragraph 11.25(D), ORR may have regard to any representation (including any submission of written material) which (and to the extent that) the person making the representation shall, by notice in writing to ORR or by endorsement on the representation of words indicating the confidential nature of such representation, have specified as confidential information.
- 11.26 A notice under paragraph 11.22 above shall have effect upon such date, or the happening of such event, as shall be specified in the notice, provided that it shall in no circumstances have effect earlier than 90 days after the date upon which it shall have been given, with the exception of a notice to which paragraph 11.24 above applies, in which case the notice shall have effect 28 days after the date upon which it shall have been given.
- 11.27 A notice under paragraph 11.22 above shall not have effect in relation to any proposed modification of paragraphs 11.22 to 11.26 (inclusive) or this paragraph 11.27.

Network Rail's role as secretariat

- 11.28 Network Rail shall establish, maintain and update, as necessary, a website containing:
- (A) the current version of the EC4T Metering Rules (which for the avoidance of doubt includes the appendices);
 - (B) all previous versions of the EC4T Metering Rules (which for the avoidance of doubt includes the appendices) (together with a statement of the dates between which each respective version was in force);
 - (C) any current Proposed Metering Rules Changes together with any representations received in response to the same;
 - (D) a fully searchable archive containing details of consultations held, representations received and votes held (including identifying how each Metered Train Operator voted) in relation to all previous Proposed Metering Rules Changes; and
 - (E) the data referred to in paragraph 10 above.
- 11.29 Network Rail shall, as soon as reasonably practicable following issue of a notice under paragraph 11.22 above or following consent to a Proposed Metering Rules Change by the Office of Rail Regulation, supply to all Metered Train Operators a revised version of the EC4T Metering Rules (which for the avoidance of doubt includes the appendices) incorporating the change.

12. List of Metered Train Operators

- 12.1 Network Rail shall maintain an up-to-date list of Metered Train Operators and make it available, on request, to train operators at all reasonable times.

13. Power Factor Correction

- 13.1 Appendix 2 to these EC4T Metering Rules sets out the Power Factor Correction (PF) for each train category (i) for the purposes of calculating the Traction Electricity Charge.

14. Network Rail Distribution System Loss Factor

- 14.1 Appendix 3 to these EC4T Metering Rules sets out the Network Rail Distribution System Loss Factor for each Traction electricity Geographic Area (g) the AC System (λ_{ACg}) and the DC System (λ_{DCg}) for the purposes of calculating the Traction Electricity Charge.

15. Tolerance Factors

- 15.1 Appendix 4 to these EC4T Metering Rules sets out the Tolerance Factors for each train category (i) for the purposes of calculating the Traction Electricity Charge.

16. Changes to Power Factor Correction or Tolerance Factors

- 16.1 If at any time after the On-Train Metering Commencement Date there is a material change to any relevant Specified Equipment or On-Train Meters used by the Train Operator which would or might result in:

- (A) the Power Factor Correction of that Specified Equipment decreasing or otherwise ceasing to correct to unity; and/or
- (B) a reduction in the accuracy of the On-Train Meters (unless the accuracy remains within the bounds required by the relevant industry standards),

the Train Operator shall as soon as reasonably practicable notify Network Rail and discuss whether any amendments need to be made to the corresponding values in Appendix 2 and/or Appendix 4 to ensure that the Traction Electricity Charge is calculated accurately.

17. Changes to Appendix 2 (Power Factor Correction) and Appendix 4 (Tolerance Factors)

- 17.1 No amendment to Appendices 2 or 4 of these EC4T Metering Rules shall have effect unless ORR has given its consent to the amendment under either paragraph 11 or this paragraph 17.
- 17.2 Network Rail, a Metered Train Operator or a Prospective Metered Train Operator may propose to ORR that the tables in Appendices 2 and/or 4 be amended to:
- (A) include new entries to facilitate the billing of traction electricity using On-Train Meters;

- (B) improve the accuracy of the Traction Electricity Charge payable by a Metered Train Operator;
- (C) remove redundant entries or increase clarity; and/or
- (D) make any other modifications which it believes would be necessary or desirable as a consequence of any changes under paragraphs 17.2(A) to 17.2(C) (inclusive) above.

17.3 Any proposition of a kind referred to in paragraph 17.2 shall detail:

- (A) the reasons for the proposal and, where appropriate, include supporting technical data to justify any value to be inserted into the table; and
- (B) the extent to which Network Rail and any Metered Train Operators whose Traction Electricity Charges would be affected by the proposed amendment support the proposal.

Co-operation and information

17.4 ORR may request further information from the party that is proposing a change under paragraph 17.2 and/or any party that would be affected by the change.

17.5 Any party of whom a request for further information is made in accordance with 17.4 shall provide the requested information promptly and to the standard required by ORR, and if it fails to do so, ORR shall be entitled to proceed with its consideration of the matter in question and to reach a decision in relation to it without the information in question and the party in default shall have no grounds for complaint in that respect.

ORR consent to a proposed change to Appendices 2 and 4

17.6 If ORR is satisfied with a proposal submitted to it under paragraph 17.2 to amend Appendices 2 and/or 4, it may issue an Appendix Amendment Notice to Network Rail consenting to those amendments.

17.7 If ORR gives notice that it is not satisfied with the proposal submitted to it under paragraph 17.2, it may:

- (A) reject the proposal; or
- (B) following consultation with those parties it considers would be directly affected by the change, determine the changes to Appendix 2 and/or Appendix 4 and give an Appendix Amendment Notice to Network Rail specifying those changes.

17.8 Appendices 2 and/or 4 (as the case may be) shall have effect with the changes specified by ORR in an Appendix Amendment Notice from the date specified in that notice for this purpose.

18. Transitional Risk Sharing Mechanism

18.1 The provisions set out in this paragraph 18 shall remain in effect up to and including 31 March 2014, after which time they shall cease to apply.

18.2 For the purposes of this paragraph 18, a “**Modelled Train Operator**” means a train operator who, in respect of Geographic Area g, is charged by Network Rail for traction electricity based (either wholly or partly) on calibrated modelled consumption rates.

18.3

Passenger operators

- (A) Subject to paragraphs 18.5 and 18.6(A), Network Rail shall pay a rebate (the “**TRSM Rebate**”) in accordance with paragraph 18.4(A) to each Modelled Train Operator operating railway passenger services in Geographic Area g if in respect of any Relevant Year t:

$$CR_{gt} > Cap_{gt0}$$

where:

t0 means the Relevant Year immediately preceding the first Relevant Year in which, in Geographic Area g:

$$(L_{megt0} + L_{mugt0}) > (10\% \bullet A_{gt0})$$

where:

L_{megt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0;

L_{mugt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0; and

A_{gt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0;

CR_{gt} is derived from the following formula:

$$CR_{gt} = \frac{CPW_{gt}}{\sum UE_{igjt}}$$

where:

Σ means the summation across all relevant train categories i and tariff bands j, as appropriate;

CPW_{gt} means the Modelled Train Operator’s total post-Volume Reconciliation consumption in Geographic Area g, in Relevant Year t, derived from the following formula:

$$CPW_{gt} = \sum C_i \bullet UE_{igt} \bullet (1 + PVR_{gt})$$

where:

Σ means the summation across all relevant train categories i and tariff bands j, as appropriate;

C_i means the calibrated modelled consumption rate (in kWh per Train Mile in relation to passenger electric multiple units and kWh per Gross Tonne Mile in relation to locomotive-hauled units and all freight traffic) for train category i shown in the Traction Electricity Consumption Rates List;

UE_{igt} means the actual volume of usage (in electrified Vehicle Miles in relation to passenger electric multiple units or Gross Tonne Miles in relation to locomotive hauled units and all freight traffic), if any, of all trains operated by or on behalf of the Modelled Train Operator, in train category i, in Geographic Area g, in tariff band j and in Relevant Year t, calculated in accordance with paragraph 4.1 or 4.1.2 (as the case may be) of Part 2 of Schedule 7 of the Modelled Train Operator's track access contract;

PVR_{gt} for the relevant Geographic Area g, in Relevant Year t, is derived from the following formula:

$$PVR_{gt} = \frac{(A_{gt} - L_{megt} - L_{megt} - L_{mugt})}{L_{megt}}$$

where:

A_{gt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t;

L_{megt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t;

L_{megt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t; and

L_{mugt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t;

Cap_{gt0} is derived from the following formula:

$$Cap_{gt0} = CR_{gt0} \bullet (1 + 7.5\%)$$

where:

CR_{gt0} is derived from the following formula:

$$CR_{gt0} = \frac{CPW_{gt0}}{\sum UE_{igjt0}}$$

where:

Σ means the summation across all relevant train categories i and tariff bands j, as appropriate;

CPW_{gt0} means the Modelled Train Operator's total post-Volume Reconciliation consumption in Geographic Area g, in Relevant Year t0, derived from the following formula:

$$CPW_{gt0} = \sum C_i \bullet UE_{igjt0} \bullet (1 + PVR_{gt0})$$

where:

Σ means the summation across all relevant train categories i and tariff bands j, as appropriate;

C_i means the calibrated modelled consumption rate (in kWh per Train Mile in relation to passenger electric multiple units and kWh per Gross Tonne Mile in relation to locomotive-hauled units and all freight traffic) for train category i shown in the Traction Electricity Consumption Rates List;

UE_{igjt0} means the actual volume of usage (in electrified Vehicle Miles in relation to passenger electric multiple units or Gross Tonne Miles in relation to locomotive hauled units and all freight traffic), if any, of all trains operated by or on behalf of the Modelled Train Operator, in train category i, in Geographic Area g, in tariff band j and

in Relevant Year t0, calculated in accordance with paragraph 4.1 or 4.1.2 (as the case may be) of Part 2 of Schedule 7 of the Modelled Train Operator's track access contract;

PVR_{gt0} for the relevant Geographic Area g, in Relevant Year t0 is derived from the following formula:

$$PVR_{gt0} = \frac{(A_{gt0} - L_{mogt0} - L_{megt0} - L_{mugt0})}{L_{mogt0}}$$

where:

A_{gt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0;

L_{mogt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0;

L_{megt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0; and

L_{mugt0} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0.

Freight operators

- (B) Subject to paragraphs 18.5 and 18.6(B), Network Rail shall pay a rebate (the “**TRSM Rebate**”) in accordance with paragraph 18.4(B) to each Modelled Train Operator operating services for the carriage of goods by railway in Geographic Area g if in respect of any Relevant Year t:

$$CR_{gt} > Cap_{gt0}$$

where:

t_0 means the Relevant Year immediately preceding the first Relevant Year in which, in Geographic Area g:

$$(L_{megt_0} + L_{mugt_0}) > (10\% \bullet A_{gt_0})$$

where:

L_{megt_0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t_0 ;

L_{mugt_0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t_0 ; and

A_{gt_0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t_0 ;

CR_{gt} is derived from the following formula:

$$CR_{gt} = \frac{CPW_{gt}}{\sum (KGTM_{igt} \bullet 1000)}$$

where:

Σ means the summation across all relevant train categories i;

CPW_{gt} means the Modelled Train Operator's total post-Volume Reconciliation consumption in Geographic Area g, in Relevant Year t, derived from the following formula:

$$CPW_{gt} = \sum C_i \bullet (KGTM_{igt} \bullet 1000) \bullet (1 + PVR_{gt})$$

where:

Σ means the summation across all relevant train categories i, as appropriate;

C_i means the calibrated modelled consumption rate (in kWh per Train Mile in relation to passenger electric multiple units and kWh per Gross Tonne Mile in relation to locomotive-hauled units and all freight traffic) for train category i, shown in the Traction Electricity Consumption Rates List;

$KGTM_{igt}$ means 1000 Gross Tonne Miles for train category i in Geographic Area g in Relevant Year t ;

PVR_{gt} for the relevant Geographic Area g , in Relevant Year t , is derived from the following formula:

$$PVR_{gt} = \frac{(A_{gt} - L_{mogt} - L_{megt} - L_{mugt})}{L_{mogt}}$$

where:

A_{gt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ;

L_{mogt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ;

L_{megt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ; and

L_{mugt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ;

Cap_{gt0} is derived from the following formula:

$$Cap_{gt0} = CR_{gt0} \bullet (1 + 7.5\%)$$

where:

CR_{gt0} is derived from the following formula:

$$CR_{gt0} = \frac{CPW_{gt0}}{\sum (KGTM_{igt} \bullet 1000)}$$

where:

Σ means the summation across all relevant train categories i ;

CPW_{gt0} means the Modelled Train Operator's total post-Volume Reconciliation consumption in Geographic Area g, in Relevant Year t0, derived from the following formula:

$$CPW_{gt0} = \sum C_i \cdot (KGTM_{igt0} \cdot 1000) \cdot (1 + PVR_{gt0})$$

where:

Σ means the summation across all relevant train categories i;

C_i means the calibrated modelled consumption rate (in kWh per Train Mile in relation to passenger electric multiple units and kWh per Gross Tonne Mile in relation to locomotive-hauled units and all freight traffic) for train category i, shown in the Traction Electricity Consumption Rates List;

$KGTM_{igt0}$ means 1000 Gross Tonne Miles for train category i in Geographic Area g in Relevant Year t0;

PVR_{gt0} for the relevant Geographic Area g, in Relevant Year t0 is derived from the following formula:

$$PVR_{gt0} = \frac{(A_{gt0} - L_{megt0} - L_{megt0} - L_{mugt0})}{L_{megt0}}$$

where:

A_{gt0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0;

L_{megt0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0;

L_{megt0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access

Contract in Geographic Area g for Relevant Year t0; and

L_{mugt0} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t0.

18.4

Passenger operators

- (A) The TRSM Rebate payable to a Modelled Train Operator operating railway passenger services in respect of Relevant Year t and Geographic Area g shall be calculated in accordance with the following formula:

$$TRSMREBATE_{gt} = (CR_{gt} - Cap_{gt0}) \cdot \sum UE_{ijgt} \cdot P_t$$

where:

Σ means the summation across all relevant train categories i and tariff bands j, as appropriate;

t has the meaning given to it in paragraph 18.3(A);

t0 has the meaning given to it in paragraph 18.3(A);

CR_{gt} has the meaning given to it in paragraph 18.3(A);

Cap_{gt0} has the meaning given to it in paragraph 18.3(A);

UE_{ijgt} has the meaning given to it in paragraph 18.3(A);

P_t across all relevant Geographic Areas, g, is derived from the following formula:

$$P_t = \frac{(E_{tmo} + S1_t)}{\sum CPW_{gt}}$$

where:

Σ means the summation across all Geographic Areas g;

E_{tmo} means the amount calculated in accordance with paragraph 4.1 or 4.1.2 (as the case may be) of Part 2 of Schedule 7 of the Modelled Train Operator's track access contract;

$S1_t$ means the supplementary amount payable by or to the Modelled Train Operator pursuant to paragraph 5.2 of

Part 2 of Schedule 7 of the Modelled Train Operator's track access contract; and

CPW_{gt} has the meaning given to it in paragraph 18.3(A).

Freight operators

- (B) The TRSM Rebate payable to a Modelled Train Operator operating services for the carriage of goods by railway in respect of Relevant Year t and Geographic Area g shall be calculated in accordance with the following formula:

$$TRSMREBATE_{gt} = (CR_{gt} - Cap_{gt0}) \cdot \sum (KGTM_{igt} \cdot 1000) \cdot P_t$$

where:

Σ means the summation across all relevant train categories i;

t has the meaning given to it in paragraph 18.3(B);

t0 has the meaning given to it in paragraph 18.3(B);

CR_{gt} has the meaning given to it in paragraph 18.3(B);

Cap_{gt0} has the meaning given to it in paragraph 18.3(B);

UE_{igt} has the meaning given to it in paragraph 18.3(B);

P_t across all relevant Geographic Areas, g, is derived from the following formula:

$$P_t = \frac{\sum (E_{gt}) + S_t}{\sum CPW_{gt}}$$

where:

Σ means the summation across all Geographic Areas g;

E_{gt} is derived from the following formula:

$$E_{gt} = \sum TER_{it} \cdot KGTM_{igt}$$

where:

Σ means the summation across all relevant train categories i across all Geographic Areas g;

TER_{it} means the Traction Electricity Rate for train category i in Relevant Year t; and

$KGTM_{igt}$ means 1000 Gross Tonne Miles for train category i in Geographic Area g in Relevant Year t ;

S_t has the meaning given to it in paragraph 2.4.2 of Schedule 7 of the Modelled Train Operator's track access contract; and

CPW_{gt} has the meaning given to it in paragraph 18.3(B).

- 18.5 In the event that a particular Modelled Train Operator operates train categories comprising passenger electric multiple units and locomotive hauled units, CR_{gt} , CR_{gt0} and Cap_{gt0} shall be calculated separately for passenger electric multiple units and locomotive hauled units respectively.

18.6

Passenger operators

- (A) No TRSM Rebate shall be payable to any Modelled Train Operator operating railway passenger services in respect of Geographic Area g if in that Geographic Area g in Relevant Year t :

$$(L_{megt} + L_{mugt}) > (90\% \bullet A_{gt})$$

where:

L_{megt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ;

L_{mugt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ; and

A_{gt} means the amount calculated in accordance with paragraph 5.2 of Part 2 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t .

Freight operators

- (B) No TRSM Rebate shall be payable to any Modelled Train Operator operating services for the carriage of goods by railway in respect of Geographic Area g if in that Geographic Area g in Relevant Year t :

$$(L_{megt} + L_{mugt}) > (90\% \bullet A_{gt})$$

where:

L_{megt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t ;

L_{mugt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t; and

A_{gt} means the amount calculated in accordance with paragraph 2.4.2.1 of Schedule 7 of the Relevant Track Access Contract in Geographic Area g for Relevant Year t.

18.7 The TRSM Rebate (if any) shall be payable within 180 days following the end of Relevant Year t.

19. Dispute Resolution

19.1 The dispute resolution processes set out in clause 13 of the Relevant Track Access Contract shall apply in respect of any dispute arising out of or in relation to these EC4T Metering Rules.

APPENDIX 1: TEMPLATE LOOK-UP TABLES

1. Journey Look-Up Tables

Table 1.1: Journey Look-Up Table for non locomotive-hauled passenger journeys – Consumption Data

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
						Consumption rate (kWhr/5 minute interval)				
Train Operator	Train Service Code	Specified Equipment	Geographic Area	Electricity Type (AC/DC)	EMU Length	1 Unit	2x Unit	3x Unit	4x Unit	Other

Table 1.2: Journey Look-Up Table for non locomotive-hauled passenger journeys – Regenerative Braking Data

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
						Consumption rate (kWhr/5 minute interval)				
Train Operator	Train Service Code	Specified Equipment	Geographic Area	Electricity Type (AC/DC)	EMU Length	1 Unit	2x Unit	3x Unit	4x Unit	Other

Table 1.3: Journey Look-Up Table for freight and locomotive-hauled passenger journeys – Consumption Data

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
					Consumption rate (kWhr/5 minute interval/tonne)				
Train Operator	Train Service Code	locomotive class	Geographic Area	Electricity Type (AC/DC)	1 Unit	2x Unit	3x Unit	4x Unit	Other

Table 1.4: Journey Look-Up Table for freight and locomotive-hauled passenger journeys – Regenerative Braking Data

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
					Consumption rate (kWhr/5 minute interval/tonne)				
Train Operator	Train Service Code	locomotive class	Geographic Area	Electricity Type (AC/DC)	1 Unit	2x Unit	3x Unit	4x Unit	Other

2. **Non-Journey Look-Up Table**

Table 2.1: Non-Journey Look-Up Table

1.	2.	3.	4.	5.
Train Operator	Specified Equipment	Geographic Area	Electricity Type (AC/DC)	Consumption rate (kWhr/5 minute interval)

APPENDIX 2: POWER FACTOR CORRECTION

The table below sets out the Power Factor Correction (PF) for each train category (i) for the purposes of calculating the Traction Electricity Charge.

Train category (i)	Power Factor	Power Factor Correction (PF _i)
Class 313	TBC	1
Class 318	TBC	1
Class 319	TBC	1
Class 320	TBC	1
Class 321	0.85	1
Class 323	1	1
Class 350	1	1
Class 365	TBC	1
Class 377	N/A	N/A
Class 390	1	1
Class 455	N/A	N/A

APPENDIX 3: NETWORK RAIL DISTRIBUTION SYSTEM LOSS FACTORS

The table below sets out the Network Rail Distribution System Loss Factor for each traction electricity Geographic Area (g) for the AC System (λ_{AC}) and the DC System (λ_{DC}) for the purposes of calculating the Traction Electricity Charge.

ESTA	Traction electricity Geographic Area (g)	Network Rail Distribution System Loss Factor for the AC System (λ_{AC})	Network Rail Distribution System Loss Factor for the DC System (λ_{DC})
M	Merseyside	0.05	0.27
N	Midland Main Line	0.05	0.27
O	London Tilbury & Southend	0.05	0.27
P	Great Eastern	0.05	0.27
Q	West Anglia	0.05	0.27
R	East Coast Main Line South	0.05	0.27
A	East Coast Main Line Central	0.05	0.27
B	East Coast Main Line North	0.05	0.27
C	East Coast Main Line Leeds	0.05	0.27
S	Scotland Glasgow	0.05	0.27
D	Scotland East	0.05	0.27
E	Scotland North & West	0.05	0.27
F	Scotland WCML	0.05	0.27
T	West Coast Main Line South	0.05	0.27
G	West Coast Main Line Central	0.05	0.27
H	West Coast Main Line West Midlands	0.05	0.27

ESTA	Traction electricity Geographic Area (g)	Network Rail Distribution System Loss Factor for the AC System (λ_{AC})	Network Rail Distribution System Loss Factor for the DC System (λ_{DC})
I	West Coast Main Line Manchester	0.05	0.27
J	West Coast Main Line North	0.05	0.27
U	Southern	0.05	0.27
V	Great Western	0.05	0.27

APPENDIX 4: TOLERANCE FACTORS

The table below sets out the Tolerance Factor for each train category (i) for the purposes of calculating the Traction Electricity Charge.

Train category (i)	On-Train Energy Measurement Function Tolerance	Tolerance Factor (δ_i)
Class 313	TBC	0.00
Class 318	TBC	0.00
Class 319	TBC	0.00
Class 320	TBC	0.00
Class 321	0.87	0.00
Class 323	0.87	0.00
Class 350	1.2247	0.00
Class 365	TBC	0.00
Class 377	0.87	0.00
Class 390	1.4	0.00
Class 455	0.87	0.00

APPENDIX 5: AMENDMENTS TO EC4T METERING RULES FOR RELEVANT YEAR 2010/2011

The EC4T Metering Rules shall apply for the Relevant Year 2010/2011 as amended in accordance with this Appendix 5.

1. Paragraph 1

1.1 The following definitions shall be added to paragraph 1:

“Calling Pattern” has the meaning ascribed to it in paragraph 1.1 of Schedule 5 of the Relevant Track Access Contract;

“Journey Time” has the meaning ascribed to it in paragraph 1.1 of Schedule 5 of the Relevant Track Access Contract;

“Relevant Days” means, in relation to a calendar month, all weekdays or all Saturdays or all Sundays falling within such month;

“Substitution Value” means the value in respect of Consumption Data or Regenerative Braking Data, as the case may be, set out in column 9 of the Journey Look-Up Table.

1.2 The references to “appendix 1” shall be replaced with “appendix 1A” in the definitions of “Journey Look-Up Table” and “Non-Journey Look-Up Table”.

2. Paragraphs 3, 4 and 5

2.1 Replace paragraphs 3, 4 and 5 with the following:

3. “Look-Up Tables

Journeys

3.1 The Train Operator shall create and maintain a Journey Look-Up Table.

3.2 Subject to paragraph 3.7, in relation to each Journey, the Journey Look-Up Table shall include:

(A) the mean value of:

(1) Consumption Data; and

(2) where relevant, Regenerative Braking Data,

recorded by the relevant On-Train Meters, calculated, unless otherwise agreed between the parties, in relation to a calendar month, as the aggregate of the relevant data for Journeys with the same Calling Pattern and Journey Time on the Relevant Days, divided by the total number of such Journeys, which

shall be the Substitution Value in relation to Consumption Data and Regenerative Braking Data for such Journey; and

(B) the mean value of:

(1) Consumption Data; and

(2) where relevant, Regenerative Braking Data,

recorded by the On-Train Meter relating to each 5 minute segment of the relevant Journey, which shall be calculated by dividing the Substitution Value in relation to Consumption Data and Regenerative Braking Data for such Journey by the number (rounded up or down, as appropriate) of 5 minute segments within such Journey, which shall be the Infill Value in relation to Consumption Data and Regenerative Braking Data for such Journey.

Non-Journeys

3.3 The Train Operator shall create and maintain a Non-Journey Look-Up Table.

3.4 Subject to paragraph 3.7, in relation to Non-Journeys at each location, the Non-Journey Look-Up Table shall include the mean value of Consumption Data relating to each 5 minute segment of each relevant Non-Journey, which shall be calculated either:

(A) by dividing the total value of Consumption Data recorded by On-Train Meters in relation to the relevant Non-Journeys at a particular location over a 12-month period by the total number of 5 minute segments within such Non-Journeys over the relevant 12-month period; or

(B) subject to agreement by Network Rail (such agreement not to be unreasonably withheld or delayed) by dividing the total value of Consumption Data recorded by On-Train Meters in relation to Non-Journeys at all locations over a 12-month period by the total number of 5 minute segments within such Non-Journeys over the relevant 12-month period,

which shall be the "Infill Value" in relation to Consumption Data for a Non-Journey at such location.

General

3.5 The Train Operator shall update the Look-Up Tables as soon as reasonably practicable after the start of each Relevant Year. The form and content of the Look-Up Tables shall be as set out in appendix 1A unless otherwise agreed between the parties.

3.6 ORR approval shall not be required for the creation or updating of the Look-Up Tables.

3.7 Where Consumption Data and, where relevant, Regenerative Braking Data collected from On-Train Meters of the relevant Specified Equipment for a 12-month period is not available:

- (A) appropriate values in relation to Journeys and Non-Journeys for which actual historic data is not available may be agreed between the parties and following any such agreement, such agreed values shall apply until such time as actual historic data is available, when such data shall be used to populate the Look-Up Tables, or the parties cease to agree, in which case paragraph 3.7(B) shall apply,
- (B) in the absence of agreement between the parties in accordance with paragraph (A) above, modelled Consumption Data and, where relevant, the modelled consumption rate in respect of regenerative braking for the relevant Specified Equipment shall be used in respect of each calendar month for which actual historic data is not available until such time as actual historic data is available, when such data shall be used to populate the Look-Up Tables.

3.8 In addition to any other rights of Network Rail whether contained in the Relevant Track Access Contract or otherwise, copies of the current Look-Up Tables shall be made available by the Train Operator to Network Rail at all reasonable times.

4. Infilling or substitution of missing Metered Data for Journeys

4.1 If, in respect of a Journey for a particular day:

- (A) up to 25% of Consumption Data is missing from the Metered Data; or
- (B) up to 25% of the Regenerative Braking Data is missing from the Metered Data

then each 5 minute segment of missing Consumption Data or Regenerative Braking Data (as the case may be) in respect of such Journey, shall be infilled with the relevant Infill Values contained in column 11 of the Journey Look-Up Table.

4.2 If, in respect of a Journey for a particular day:

- (A) more than 25% of Consumption Data is missing from the Metered Data; or
- (B) more than 25% of the Regenerative Braking Data is missing from the Metered Data; or
- (C) the Metered Data is not provided by the Train Operator to Network Rail within 7 days (pursuant to paragraph 2.2 above),

the entire Consumption Data or Regenerative Braking Data (as the case may be) in respect of such Journey, shall be substituted with the

relevant Substitution Values contained in column 9 of the Journey Look-Up Table.

5. Infilling of missing Metered Data for Non-Journeys

- 5.1 If, in respect of a Non-Journey for a particular day, any Consumption Data is missing from the Metered Data in respect of such Non-Journey, or such data is not provided by the Train Operator to Network Rail within 7 days (pursuant to paragraph 2.2 above) then each 5 minute segment of missing Consumption Data in respect of such Non-Journey, shall be infilled with the relevant Infill Value contained in column 4 of the Non-Journey Look-Up Table.

3. Appendix 1

- 3.1 Appendix 1 shall be replaced with the Appendix 1A attached.

APPENDIX 1A: TEMPLATE LOOK-UP TABLE FOR RELEVANT YEAR 2010/2011

Journey Look-Up Table

1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	11.	
								Substitution Value (kWh):			Infill Value (kWh):	
Month	Relevant Day (Weekdays, Saturdays or Sundays)	Year	Headcode	Specified Equipment	From	To	Via	Consumption Data	Regenerative Braking Data	No. of 5 minute segments	Consumption Data	Regenerative Braking Data

Non-Journey Look-Up Table

1.	2.	3.	4.
			Infill Value (kWh):
Year	Location	Specified Equipment	Consumption Data