

Train Operator (collectively, the “Train Operators” and each a “Train Operator”)	Train Operator Company Number	Original Date of Track Access Agreement
Hull Trains Company Limited	0371540	17 March 2016
Keolis Amey Operations / Gweithrediadau Keolis Amey Limited	11389531	5 February 2004
London North Eastern Railway Limited	04659712	3 March 2017
London & South Eastern Railway Limited	04860660	6 December 2007
Loram UK Limited	06031483	12 January 2017
Merseyrail Electrics 2002 Limited	04356933	17 July 2003
MTR Corporation (Crossrail) Limited	08754715	21 November 2018
Rail Operations (UK) Limited	08556176	21 March 2015
Serco Caledonian Sleepers Limited	SC477821	5 March 2015
South Yorkshire Supertram Limited	02634683	4 May 2018
Trenitalia c2c Limited	07897267	3 March 2017
Victa Railfreight Limited	03017321	17 April 2015
Vintage Trains Limited	10436785	5 September 2018
West Coast Railway Company Ltd	03066109	5 April 2016
West Coast Trains Limited	03007940	1 September 2011
West Midlands Trains Limited	09860466	3 March 2016
XC Trains Limited	04402048	8 August 2017

Part 2 – Other addressees

Rail for London Limited

Merseyside Passenger Transport Executive

Welsh Government

ANNEX 2

STANDARD AMENDMENTS

Explanatory Note:

*In order to give effect to the ORR's conclusions on the Review, this Annex 2 sets out the standard form proposed relevant changes to be made to the Traction Electricity Rules (the "**standard amendments**").*

The following amendments shall be made to the Traction Electricity Rules:

1 Amendments to the Traction Electricity Rules

1.1 In paragraph 1.2 (Definitions and Interpretation) of the Traction Electricity Rules:

(a) delete the definition of “Appendix Amendment Notice”;

(b) insert the following new definition in alphabetical order:

“**Bimodal Electric Multiple Unit**” has the meaning ascribed to it in Schedule 7 of the relevant track access agreement;”

(c) insert the following new definition in alphabetical order:

“**Bimodal Locomotive**” has the meaning ascribed to it in Schedule 7 of the relevant track access agreement;”

(d) in the definition of “Metered Train m”, delete the words “, or Appendix 2 or Appendix 4 to these Traction Electricity Rules”;

(e) delete the definition of “Modelled Train Operator” and replace it with the following definition:

“**Modelled Train Operator**” means a train operator, other than a Charter Train Operator, that is charged by Network Rail for traction electricity based on modelled consumption rates or the Traction Electricity Modelled Default Rate, and which is not a Metered Train Operator;”

(f) insert the following new definition in alphabetical order:

“**New Modelled Train**” has the meaning ascribed to it in Schedule 7 of the relevant track access agreement;”

(g) delete the definition of “Power Factor Correction”;

- (h) delete the definition of “Regenerative Braking Discount” and replace it with the following definition:

“**Regenerative Braking Discount**” means the discount, applied by Network Rail in accordance with paragraph 15.1(B) in calculating the train operator’s Traction Electricity Charges, which is provided in return for the train operator operating a Regenerative Braking System in respect of any vehicle for which the Traction Electricity Charges are payable based on modelled consumption rates or the Traction Electricity Modelled Default Rate;

- (i) delete the definition of “Tolerance Factor”;
- (j) insert the following new definition in alphabetical order:

“**Traction Electricity Modelled Default Rate**” has the meaning ascribed to it in Schedule 7 of the relevant track access contract;”

- (k) insert the following new definition in alphabetical order:

“**Traction-Train Compatible**” has the meaning ascribed to it in Schedule 7 of the relevant track access contract;”

- (l) delete the definition of “Train category” and replace it with the following definition:

“**Train category**” means train category i as identified in the relevant section of the Traction Electricity Modelled Consumption Rates List or PFM Rates List, being either:

- (a) where there is no PFM Rate for a particular passenger vehicle type operating on a particular Train Service Code:
- (i) where there is a modelled consumption rate for a particular passenger vehicle type operating on a particular Train Service Code, the relevant category set out in the table entitled “Passenger Traction Electricity Modelled Consumption Rates for CP6”; or

(ii) where there is a generic consumption rate for a passenger vehicle type not referred to in paragraph (a)(i), the relevant category set out in the table entitled “Generic Traction Electricity Modelled Consumption Rates for CP6”, or

(b) where there is a PFM Rate for a particular passenger vehicle type operating on a particular Train Service Code, the relevant category set out in the PFM Rates List; or

(c) in respect of all electrified freight services, the relevant category set out in the table entitled “Freight Traction Electricity Modelled Consumption Rates for CP6”;

1.2 Delete paragraph 9 (Power Factor Correction), and replace it with the words “(Not used)”.

1.3 Delete paragraph 11 (Tolerance Factors), and replace it with the words “(Not used)”.

1.4 Delete paragraph 12 (Changes to Power Factor Correction or Tolerance Factors), and replace it with the words “(Not used)”.

1.5 Delete paragraph 13 (Changes to Appendix 2 (Power Factor Correction) and Appendix 4 (Tolerance Factors)), and replace it with the words “(Not used)”.

1.6 In paragraph 14.13 (Creation of a kWh ‘per Train Mile’ Derived Rate: PFM Year 1):

(a) delete the formula in the definition of K_{i0} , and replace it with the following:

$$“K_{i0} = \sum [P_{i0} \bullet (1 + \lambda_{gi1}) - RGB_{i0}] \bullet N_{v0}”$$

(b) delete the definition of λ_{gv0} and replace it with the following definition:

“ λ_{gi1} means the Network Rail Distribution System Loss Factor for train category i and in Geographic Area g as set out in Appendix 3 of these Traction Electricity Rules as applicable in PFM Year 1;”

(c) in the definition of N_{v0} :

(1) delete the formula in the definition of T_{v0} , and replace it with the following:

$$“T_{v0} = \Sigma [(P_{vJ0} \bullet (1+ \lambda_{gv1}) - RGB_{vJ0}) + (P_{vN0} \bullet (1+ \lambda_{gv1}) - RGB_{vN0})]”$$

- (2) delete the definition of λ_{gv0} and replace it with the following definition:

“ λ_{gv1} means the Network Rail Distribution System Loss Factor for vehicle class V and in Geographic Area g as set out in Appendix 3 of these Traction Electricity Rules as applicable in PFM Year 1;”

- (3) delete the formula in the definition of V_{v0} and replace it with the following:

$$“V_{v0} = \Sigma [(P_{vJ0} \bullet (1+ \lambda_{gv1}) - RGB_{vJ0})]”$$

- (4) delete the definition of λ_{gv0} and replace it with the following definition:

“ λ_{gv1} means the Network Rail Distribution System Loss Factor for vehicle class V and in Geographic Area g as set out in Appendix 3 of these Traction Electricity Rules as applicable in PFM Year 1; and”

1.7 In paragraph 14.14 (PFM Year 2 and subsequent PFM Years):

- (a) in the definition of K_{iy-1} :

- (1) delete the formula and replace it with the following:

$$“K_{iy-1} = \Sigma [P_{iy-1} \bullet (1+\lambda_{gij}) - RGB_{iy-1}] \bullet N_{vy-1}”$$

- (2) delete the definition of λ_{gij-1} and replace it with the following definition:

“ λ_{gij} means the Network Rail Distribution System Loss Factor for train category i and in Geographic Area g as set out in Appendix 3 of these Traction Electricity Rules as applicable in PFM Year y;”

- (3) in the definition of T_{vy-1} :

- (i) delete the formula and replace it with the following:

$$T_{vy-1} = \Sigma [(P_{vJy-1} \bullet (1+ \lambda_{gvY}) - RGB_{vJy-1}) + (P_{vNy-1} \bullet (1+ \lambda_{gvY}) - RGB_{vNy-1})]$$

- (ii) delete the definition λ_{gvY-1} , and replace it with the following definition:

“ λ_{gvy} means the Network Rail Distribution System Loss Factor for vehicle class V and in Geographic Area g as set out in Appendix 3 of these Traction Electricity Rules as applicable in PFM Year y;”

(b) in the definition of V_{vy-1} :

(1) delete the formula and replace it with the following:

$$"V_{vy-1} = \sum [(P_{vJy-1} \cdot (1 + \lambda_{gvy}) - RGB_{vJy-1})]"$$

(2) delete the definition of λ_{gvy-1} and replace it with the following definition:

“ λ_{gvy} means the Network Rail Distribution System Loss Factor for vehicle class V and in Geographic Area g as set out in Appendix 3 of these Traction Electricity Rules as applicable in PFM Year y; and”

1.8 In paragraph 15 (Application of Regenerative Braking Discounts to modelled consumption rates):

(a) delete the heading and replace it as follows:

“Application of Regenerative Braking Discounts to modelled (and modelled default) consumption rates”

(b) in sub-paragraph 15.1(B):

(i) delete the second sentence and replace it with the following:

“The levels of Regenerative Braking Discount are applied by reducing the relevant modelled consumption rate and/or Traction Electricity Modelled Default Rate (as the case may be) by the percentage discount specified below:”

- (ii) delete the table showing “Type of infrastructure/service frequency” and replace it with the following table:

Type of infrastructure / service frequency	Discount (%)
AC, Long Distance (more than 10 miles between stations)	16%
AC, Suburban (less than or equal to 10 miles between stations)	22%
DC	15%

- (c) delete sub-paragraph 15.5(B) and replace it with the following:

“(B) where any of the train operator’s Relevant Vehicle Categories cease to be billed on the basis of either of the modelled consumption rates or the Traction Electricity Modelled Default Rate, in which case the discount shall cease to apply in respect of such Relevant Vehicle Categories; or”

1.9 In paragraph 18 (Volume and Cost Reconciliation for all train operators):

- (a) delete the heading “Transitional risk sharing mechanism rebate for the Relevant Year ending on 31 March 2014” and paragraphs 18A.1 and 18A.2;
- (b) delete paragraph 18.2 and replace it with the following:

“Volume Reconciliation

18.2 For each train operator ω , $S1_{t\omega}$ is derived from the following formula:

$$S1_{t\omega} = \sum S1_{tg\omega}, \text{ summed over } g$$

where, for each Geographic Area g , $S1_{tg\omega}$ is derived from the following formula:

$$S1_{tg\omega} = E_{tmog\omega} \bullet (A_{gt} - L_{tmog} - L_{tmeg} - L_{tmug} - L_{tmng}) / (L_{tmog} + L_{tmng} + (\lambda_g / (1 + \lambda_g)) \bullet A_{gt})$$

where:

$E_{tmog\omega}$ means the amount E_{tmog} calculated for each train operator ω in accordance with paragraph 4.1.2 of Part 2 (in the case of passenger operators) and paragraph 2.4.1.2 (in the case of freight operators) of Schedule 7 of the relevant train operator's track access contract;

A_{gt} means the total actual electricity consumption (in kWh), if any, in Geographic Area g in Relevant Year t billed to Network Rail by its electricity suppliers in that Geographic Area for traction electricity consumed in accordance with the terms for the purchase of traction electricity entered into by Network Rail;

L_{tmog} means the total modelled traction electricity consumption (including any consumption calculated using the Traction Electricity Modelled Default Rate) charged to all train operators in Geographic Area g and in Relevant Year t which is derived from the following formula:

$$L_{tmog} = \sum C_i \bullet UE_{igit}$$

where:

Σ means the summation across all train categories i , New Modelled Trains and tariff bands j for Relevant Year t for all train operators, as appropriate;

C_i means, as appropriate:

(a) the consumption rate:

(i) in kWh per electrified Train Mile in relation to passenger electric multiple units (using the rate for the relevant number of units); or

(ii) in kWh per electrified kgm in relation to locomotive-hauled units and all freight traffic,

for train category i shown in the Traction Electricity Modelled Consumption Rates List taking into account any Regenerative Braking Discount applied

in accordance with these Traction Electricity Rules or, if a PFM Rate applies in accordance with these Traction Electricity Rules, the PFM Rates List; or

- (b) for New Modelled Trains, the Traction Electricity Modelled Default Rate shown in the Traction Electricity Modelled Consumption Rates List, taking into account any Regenerative Braking Discount applied in accordance with these Traction Electricity Rules;

UE_{igt} means the actual volume of usage (in electrified Vehicle Miles in relation to passenger electric multiple units or electrified kgm in relation to locomotive-hauled units and all freight traffic), if any, of trains operated by or on behalf of all train operators in train category i and New Modelled Trains operated by or on behalf of all train operators, in Geographic Area g , where relevant, in tariff band j and in Relevant Year t , provided that where train category i or a New Modelled Train is a Bimodal Electric Multiple Unit or Bimodal Locomotive operating in a Traction-Train Compatible situation, it shall be deemed that all mileage (in Vehicle Miles in relation to passenger electric multiple units or kgm in relation to locomotive-hauled units and all freight traffic), if any, of such trains is electrified, in respect of which charges for traction electricity consumption are payable based on modelled consumption rates pursuant to paragraph 4.1 or 4.1.2 (in the case of passenger operators) or paragraph 2.4.1 or 2.4.1.2 (in the case of freight operators) of Schedule 7 of each relevant train operator's track access contract;

L_{tmeq} means the total metered traction electricity consumption charged to all train operators in Geographic Area g and Relevant Year t which is derived from the following formula:

$$L_{tmeg} = \sum [CME_{mgjt} - RGB_{mgjt}]$$

where:

Σ means the summation across all relevant Metered Trains m for Relevant Year t for all train operators, as appropriate;

CME_{mgjt} means the consumption of electricity (in kWh) by Metered Train m, as measured by the On-Train Meters or as otherwise determined in accordance with these Traction Electricity Rules, in Geographic Area g, in tariff band j and in Relevant Year t; and

RGB_{mgjt} means the electricity (in kWh) generated by braking by Metered Train m, as measured by the On-Train Meters or as otherwise determined in accordance with these Traction Electricity Rules, in Geographic Area g, in tariff band j and in Relevant Year t;

L_{tmug} means the total amounts in respect of the Network Rail Distribution System Loss Factor charged to all train operators in Geographic Area g and Relevant Year t which is derived from the following formula:

$$L_{tmug} = L_{tmugAC} + L_{tmugDC}$$

where:

L_{tmugAC} is derived from the following formula:

$$L_{tmugAC} = \sum [CME_{mgjtAC} \bullet EF_{gjt}] \bullet \lambda_{ACg}$$

where:

Σ means the summation across all relevant Metered Trains m for Relevant Year t for all train operators, as appropriate;

CME_{mijtAC} means the consumption of electricity (in kWh) from the AC System by Metered Trains m, as measured by the On-Train Meters or as otherwise determined in accordance with these Traction Electricity Rules, in Geographic Area g, in tariff band j and in Relevant Year t;

EF_{ijt} means an amount for traction current (in pence per kWh) consumed by railway vehicles operated by or on behalf of the train operator in Geographic Area g, in tariff band j and in Relevant Year t as agreed or determined pursuant to paragraph 19 of these Traction Electricity Rules; and

λ_{ACg} means the Network Rail Distribution System Loss Factor for the AC System in Geographic Area g;

L_{tmugDC} is derived from the following formula:

$$L_{tmugDC} = \sum [CME_{mijtDC} \bullet EF_{ijt}] \bullet \lambda_{DCg}$$

where:

Σ means the summation across all relevant Metered Trains m for Relevant Year t for all train operators, as appropriate;

CME_{mijtDC} means the consumption of electricity (in kWh) from the DC System by Metered Trains m, as measured by the On-Train Meters or as otherwise determined in accordance with these Traction Electricity Rules, in Geographic Area g, in tariff band j and in Relevant Year t;

EF_{ijt} means an amount for traction current (in pence per kWh) consumed by railway vehicles operated by or on behalf of the train operator in Geographic Area g,

in tariff band j and in Relevant Year t as agreed or determined pursuant to paragraph 19 of these Traction Electricity Rules; and

λ_{DCg} means the Network Rail Distribution System Loss Factor for the DC System in Geographic Area g;

L_{tmng} means the total traction electricity consumption in Geographic Area g and in Relevant Year t by: (a) Network Rail, and (b) all entities whose consumption is not modelled or metered in a track access contract subject to regulation by ORR in accordance with the Act; and

λ_g means, in any Geographic Area g which only uses the DC System, the Network Rail Distribution System Loss Factor for the DC System in Geographic Area g (λ_{DCg}), and, in any other Geographic Area g, means the Network Rail Distribution System Loss Factor for the AC System in Geographic Area g (λ_{ACg}).

- 1.10 Delete Appendix 2 (Power Factor Correction) and replace it with the words “Appendix 2 (not used)”.
- 1.11 Delete Appendix 3 (Network Rail Distribution System Loss Factors) and replace it with the new Appendix 3 set out in Appendix 1 to this Annex 2.
- 1.12 Delete Appendix 4 (Tolerance Factors) and replace it with the words “Appendix 4 (not used)”.

APPENDIX 1 TO ANNEX 2

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	N/A	0.1113
N	Midland Main Line	0.0279	N/A
O	London Tilbury and Southend	0.0264	N/A
P	Great Eastern	0.0272	0.1113
Q	West Anglia	0.0428	N/A
R	East Coast Main Line South	0.0230	0.1113
A	East Coast Main Line Central	0.0303	N/A
B	East Coast Main Line North	0.0548	N/A
C	East Coast Main Line Leeds	0.0409	N/A
S	Scotland Glasgow	0.0424	N/A
D	Scotland East	0.0462	N/A
E	Scotland North and West	0.0311	N/A
F	Scotland WCML	0.0356	N/A
T	West Coast Main Line South	0.0295	0.1113

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})
G	West Coast Main Line Central	0.0362	N/A
H	West Coast Main Line Midlands	0.0299	N/A
J	West Coast Main Line North	0.0361	N/A
U	Southern	N/A	0.1113
V	Great Western (soon to be renamed 'Western East')	0.0119	N/A
I	Western (soon to be renamed 'Western West')	0.0254	N/A
K (soon to be renamed '3')	South Wales	0.0254	N/A