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To: all train operators and ORR

10 October 2013

Dear colleague,

Network Rail's revised proposal for EC4T and confirmation of the proposed treatment of light locomotive movements in CP5

1. Purpose

The purpose of this letter is to set out a revised proposal for charging charter operators for their use of EC4T (electric current for traction) and to confirm our proposal for charging charter operators for light locomotive movements in CP5.

2. Background

In summer 2013, we consulted¹ and concluded² on our proposals for the structure of charges and Schedule 8 performance regime for charter operators for CP5.

In August 2013, ORR published its draft conclusions³ on the structure of charges and Schedule 8 performance regime for charter operators for CP5. ORR is now consulting on the contractual implementation of those draft conclusions. ORR's consultation closes on 25 October 2013.

In our August 2013 conclusions document we stated that we would consider further the following two outstanding issues relating to charges for charter operators:

- EC4T charges; and
- Charging for light locomotive movements.

In subsequent discussions, we agreed to write to ORR and the industry in relation to these issues by 10 October 2013, ahead of the 25 October 2013 deadline for responses to its charter implementation consultation.

¹ Network Rail charter consultation available at: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064786015>

² Network Rail charter conclusions available at: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064787226>

³ ORR's draft conclusions available at: <http://www.rail-reg.gov.uk/pr13/consultations/charter-operators.php>

Following careful consideration, in this letter and its annexes, we propose a way forward in relation to both of these issues for CP5.

3. EC4T charges

[Annex A](#) sets out our revised proposal for charging charter operators for their use of EC4T (electric current for traction). The key points of this revised proposal are:

- to use the “Generic default (Locomotive & coaches): parcels / mail” EC4T consumption rate which is a kWh per KGTM rate, set out in the CP4 Freight Traction Electricity Consumption Rates list⁴. We propose using this as a proxy rate for all charter services. We propose to convert this to a ‘per train-mile’ rate based on a typical charter train ‘consist’, and apply the same rate to all electric charter services. If a charter operator wishes, it may commission consultants to calculate a specific modelled consumption rate for its service codes in line with the agreed methodology for calculating new consumption rates (set out in Annex B for reference);
- to apply a blended average pence per kWh tariff, which we would publish before each financial year begins. This tariff would reflect all energy and delivery tariffs and would be consistent with the market-based tariff paid by Network Rail for our own traction and non-traction electricity; and
- recognising the low materiality of charter EC4T charges, that charter operators do not participate in either the volume or cost wash-up.

4. Charging for light locomotive movements

In our response to ORR’s August 2013 draft conclusions on the structure of charges and performance regime for charter operators in CP5, we stated that we welcomed ORR’s decision to accept our proposed approach in relation to charging charter operators for light locomotive movements (i.e. charging non-steam light locomotive movements **£0.56 per train mile** and charging steam light locomotive movements **£0.60 per train mile**).

However, we also stated that we were reviewing whether from a billing perspective it is possible or administratively efficient to identify light locomotive movements and charge them a separate rate as proposed in our conclusions to ORR. In particular, we were considering the feasibility of isolating steam light locomotive movements, travelling with a support coach, for charging purposes.

We have now reviewed this issue and can confirm that we are able to separately identify and charge light locomotive movements, including steam light locomotive movements travelling with a support coach, consistent with our August conclusions document and ORR’s draft conclusions. This will be done as a manual process outside our core TABS billing system.

Our review highlighted, however, that in some instances ‘consist’ information for charter train movements are not provided by the operator. In this situation, and the

⁴ Available at:
<http://www.networkrail.co.uk/browse%20documents/regulatory%20documents/access%20charges%20reviews/cp4%20charges/c%20-%20traction%20electricity%20consumption%20rates%20list%20for%20cp4.pdf>

absence of better information, Network Rail currently assumes a default 'consist'. We propose retaining this approach in CP5 and, as a result, if charter operators do not appropriately provide the correct 'consist' for light locomotive movements they will be subject to the notional 'full train' VUC (variable usage charge) rate (£1.05 per train mile), rather than the lower light locomotive rates set out, above. We wanted to be transparent about this issue now in advance of the start of CP5. We consider that the higher notional 'full train' VUC rate will incentivise operators to provide the appropriate 'consist' for light locomotive movements in CP5.

5. Long- term issues for charter operators

Over the longer term, our preference is to fully integrate charter operations into TABS (our Track Access Billing System). This would involve billing charter trains on a per-vehicle basis rather than a typical train basis. This would increase the accuracy of charter operators' bills. This approach would also be significantly more efficient to operate as it would eliminate additional manual processes. For example, we would prefer to bill light locomotive movements and steam locomotives with a carriage, as an "empty coaching stock" move. This would automatically bill the correct amount without the need for manual intervention.

We consider that investigating ways in which to integrate charter services into TABS should be considered further, for possible implementation in CP6.

6. Next steps

ORR is currently consulting on contractual drafting amendments for charter track access contracts⁵ to implement its draft conclusions, which closes on 25 October 2013. This letter is being sent to the industry and ORR ahead of the closing date of that consultation. We will be responding separately, to ORR, on the other issues raised in its charter implementation consultation.

If you would like to discuss the issues raised in this letter, and/or its annexes, please contact Ben Worley (ben.worley@networkrail.co.uk) for issues relating to light locomotive movements or Ekta Sareen (ekta.sareen@networkrail.co.uk) for issues relating to EC4T.

This letter will also be available to download from our website shortly.

Yours sincerely,

Ekta Sareen

Senior Regulatory Economics, Network Rail

⁵ <http://www.rail-reg.gov.uk/pr13/consultations/implementing-charter-operators.php>

ANNEX A - CHARTER OPERATORS AND EC4T: NETWORK RAIL'S REVISED PROPOSAL

1. Purpose of this annex

The purpose of this annex is to set out a revised proposal for recovering EC4T costs from charter operators from the start of CP5.

2. Summary

In summer 2013, we proposed bringing charter operators' charging arrangements for EC4T, in to line with other electric train operators. After further consideration, we are proposing to calculate charter operators' EC4T charges outside of our automated billing system, TABS, to minimise billing complexity and administration for both customers and Network Rail. The key points of our revised proposal are:

- to use the "*Generic default (Locomotive & coaches): parcels / mail*" EC4T consumption rate which is a kWh per KGTM rate, set out in the CP4 Freight Traction Electricity Consumption Rates list⁶. We propose using this as a proxy rate for all charter services. We propose to convert this to a 'per train-mile' rate based on a typical charter train 'consist', and apply the same rate to all electric charter services. If a charter operator wishes, it may commission consultants to calculate a specific modelled consumption rate for its service codes in line with the agreed methodology for calculating new consumption rates (set out in [Annex B](#) for reference);
- to apply a blended average pence per kWh tariff, which we would publish before each financial year begins. This tariff would reflect all energy and delivery tariffs and would be consistent with the market-based tariff paid by Network Rail for our own traction and non-traction electricity; and
- recognising the low materiality of charter EC4T charges, that charter operators do not participate in either the volume or cost wash-up.

3. Structure of this annex

The structure of this annex is as follows:

- Background - relates to the EC4T charging framework and summarises the proposals made, in relation to EC4T and charter services, over the last few months;
- Revised proposal – this section explains our proposal;
- [Annex B](#) sets out the methodology which may be used to calculate a service code specific modelled consumption rate.

4. Background

⁶ Available at:

<http://www.networkrail.co.uk/browse%20documents/regulatory%20documents/access%20charges%20reviews/cp4%20charges/c%20-%20traction%20electricity%20consumption%20rates%20list%20for%20cp4.pdf>

4.1. *EC4T charging framework*

Around 50% of the traffic operated on the GB network is electrically powered. Traction electricity charges recover the costs of electricity supplied by Network Rail to train operators for their use of EC4T. This electricity is supplied through the overhead lines for AC (alternating current) and the 'third rail' for the DC (direct current) network which is in the southern region and Merseyside.

Around 80% of train operators' electricity consumption is still charged on the basis of modelled consumption rates. This is calculated by multiplying electrified mileage by the relevant estimated tariffs to give the modelled EC4T charge for each period. At the end of each year, Network Rail carries out two reconciliations. The first is the volume wash-up. This reconciles modelled consumption and actual consumption in each ESTA (electricity supply tariff area) to make sure that all electricity that is supplied through our network is accounted for. The year-end volume wash-up results in either a payment to or from the train operator to Network Rail.

The other year-end reconciliation is called the cost wash-up which reconciles the difference in prices charged in each period, and the actual prices we paid for that electricity. Again this results in a payment to or from train operators to Network Rail.

Metered train operators are currently charged on the basis of their metered consumption (less regenerated energy) multiplied by a mark-up to recover transmission losses (this is currently set at 5% for AC services and 27% for DC services⁷). This kWh consumption is then multiplied by the relevant electricity tariff, to produce a metered EC4T charge for each period. Metered train operators participate in the cost wash-up, but they do not participate in the volume wash-up. The exception to this is where more than 90% of an ESTA's consumption is metered, in which case this metered consumption is included in the year-end volume wash-up.⁸

4.2. *Charter operators and EC4T*

Very few electric trains are run by charter operators. The current charter trains model TAA (track access agreement) includes provisions for modelled EC4T charging. It does not, however, include provisions for the volume or cost wash-up. Furthermore, it charges electricity based on a tariff which should be indexed by IIEC (Index of Industrial Electricity Prices). Historically, it has been deemed to be administratively inefficient to put in place a robust process to charge charter operators for their EC4T, this is because electric charter traffic is very small (c. 8,000 miles for the first half of 2013/14).

4.3. *Proposals for charging charter operators for their use of EC4T in CP5*

In June 2013, we consulted on our proposal for charter operators to be billed for EC4T consistent with other electric operators. In August 2013, we concluded on this proposal.

⁷ ORR proposed, in its draft determination, that the losses mark-ups would be updated and disaggregated by ESTA from the start of CP5, with mark-ups ranging from 3.21% - 4.89% for AC, and 11.56-17.01% for DC. It has also proposed changing the mark-up so that it is levied on metered operators' gross consumption only.

⁸ ORR proposed, in its draft determination, to remove the '90% rule' from the start of CP5.

On 23 August 2013, ORR agreed with our conclusion for charter operators to be billed for EC4T consistent with other electric operators. On 13 September, ORR published its consultation on implementing PR13 for charter operators. In that consultation ORR stated:

“Assuming that we conclude that the billing process would not be disproportionate, and noting that no party objected to moving towards more cost reflective billing for traction electricity in Network Rail’s consultation, we propose that the same arrangements that apply to other operators should apply to charter operators for the billing of traction electricity.”

After further consideration we are concerned about the potential additional complexity involved billing charter operators through our main TABS system. The concerns are mainly due to the complexity involved with using TABS because charter train billing is based on train-miles and consequently requires a separate manual process outside of TABS. Operating charter billing in both the TABS and a separate manual system would introduce onerous checking and duplication of business processes. There were also some concerns around the potential contractual complexity involved with including billing charter operators’ consumption in the volume and cost wash-ups.

Recognising the materiality of this issue, the next section of this annex suggests a revised proposal for charging charter operators for their use of EC4T to address the issues described above.

5. Revised proposal

5.1. Background

Historically, it has been deemed to be administratively inefficient to put in place a robust process to charge charter operators for their EC4T, we estimate that the annual value of EC4T used by charter operators is between £15,000 and £30,000 per annum. This is within a total EC4T spend of £223 million⁹. On average, the total income received from charter operators is c. £1 million per annum, of which less than 3% relates to EC4T.

Currently, the billing approach we use for charter operators works on a ‘per-train’ basis. This approach is not automated, and is completely manual. TABS is used to capture the journeys run by charter operators, but does not calculate bills since TABS is designed to charge at a ‘per-vehicle’ basis.

5.2. Modelled consumption rates

It is our understanding that charter operators are unlikely to install on-train meters on their trains. We, therefore, would require modelled consumption rates to calculate their EC4T bills.

We are proposing to use the “*Generic default (Locomotive & coaches): parcels/mail*” as a proxy rate, which is set out the current CP4 Freight Traction Electricity

⁹ EC4T income in 2010/11

Consumption rates list. That rate is 53.61 kWh per KGTM¹⁰. We consider that it is appropriate to use this as a proxy rate as it is simple, and comparable to passenger locomotive-hauled stock which is similar to many of the charter trains operated.

To apply this rate to charter services, we would need to convert it to a 'per train-mile' rate. Our proposed approach is based on a typical charter train 'consist', of one locomotive and eleven coaches, please see below:

- A typical charter train is made up of 1 locomotive + 11 coaches
- The typical weight of each of those is:
 - Locomotive = 84.5 tonnes (based on a class 90 locomotive¹¹)
 - 11 coaches = 440 tonnes (based on a mark 1 coach weighing 38 tonnes empty and 42 tonnes full – giving an average weight of 40 tonnes)
 - Total = 524.5 tonnes
 - 53.61 kWh per KGTM * 0.5245 = **28.12 kWh / train mile**

We propose to add an entry to the Traction Electricity Consumption Rates List for CP5 - see Table 2, below.

Table 2: Proposed Charter Traction Electricity Consumption Rate for CP5

	Consumption rate (kWh per train-mile)
Charter Traction electricity consumption rate	28.12

If a charter operator wishes, it may commission consultants to calculate a specific modelled consumption rate, for its service codes, in line with the agreed methodology for calculating new consumption rates (set out in [Annex B](#) for reference).

5.3. The treatment of charter consumption in the volume wash-up

Given the small amount of charter EC4T consumption, we propose that charter operators do not participate in the volume wash-up. This would make the billing approach simpler, and reduces the need for complex contractual changes in their TAAs. It would also remove this uncertainty for charter operators.

5.4. EC4T tariff

We propose to charge charter operators a pence per kWh tariff that is consistent with the market-based tariff paid by Network Rail for our own use of traction and non-traction electricity. This tariff would be a blended average of all energy and delivery related tariffs. To facilitate this transparently, we will set out how we propose to do this by December 2013, which we will share with charter operators. The resulting

¹⁰ Available at: <http://www.networkrail.co.uk/browse%20documents/regulatory%20documents/access%20charges%20reviews/cp4%20charges/c%20-%20traction%20electricity%20consumption%20rates%20list%20for%20cp4.pdf>

¹¹ Class 90 locomotives are predominately used by DB Schenker and West Coast Railways.

process will create a transparent and open determination of the charge per kWh to charter operators.

Each year, we agree a market-based, pence per kWh, tariff with our energy supplier for any residual consumption which has not been 'fixed' through our power supply contract with our electricity supplier¹². This tariff also applies to all Network Rail consumption. We are proposing to apply a consistent tariff to charter consumption. This tariff would also include the average costs of delivery. For other operators, delivery charges are disaggregated by ESTA, however, in the interests of simplicity, we propose to average this for charter services across the GB network.

We propose to publish, on our website, the pence per kWh tariff which would apply to charter services before each financial year begins. We propose to publish this no less than one calendar month before the financial year begins.

5.5. The treatment of charter consumption in the cosh wash-up

Given the small amount of charter EC4T consumption, we propose that charter operators do not participate in the cost wash-up. This would make the billing approach simpler, and reduces the need for complex contractual changes in their TAAs. It would also remove this uncertainty for charter operators.

6. Proposed contractual changes

We consider that this revised proposal would result in minimal amendments to paragraph 6 of the charter trains model TAA. We will set out the proposed contractual amendments to implement this proposal in our response to ORR's consultation on 'Implementing PR13 for charter operators', which closes on 25 October 2013.

7. Next steps

If you would like to discuss any part of this revised proposal in more detail, please contact Ekta Sareen at ekta.sareen@networkrail.co.uk.

¹² Large operators (groups of which use at least 5% of total consumption (or from October 2014, use 1 MWh each) are able to fix their tariffs for that amount of consumption, if they wish.

ANNEX B – METHODOLOGY FOR CALCULATING NEW MODELLLED EC4T CONSUMPTION RATES DURING CP5

During CP4, new EC4T consumption rates were calculated using a methodology which was agreed by the industry for use shortly after the conclusion of PR08¹³. We proposed that this methodology is rolled forward for new vehicles for use in CP5.

The agreed methodology was developed to produce rates for new rolling stock coming onto the network during CP4. It was considered important that this methodology was broadly consistent with the TRATIM-based approach, which existing modelled rates are based on. This was considered a temporary solution given ongoing work to introduce on-train metering across the entire electric fleet during CP4 and CP5. The main principles underpinning the methodology are set out below.

TRATIM approach

It is not possible to identify all of the assumptions that underpinned the original TRATIM modelling as the relevant information is not available. However, in general, the approach taken was to model 'representative' journeys and stopping patterns which were then used to generate rates (kWh per train mile) for each combination of train service code and train 'consist'. The rates derived also include an element for auxiliary energy consumption and energy consumed during station dwell and terminal layovers. Distribution losses and energy consumed during stabling were not included and have historically been dealt with through the wash up. Similarly, energy reductions from regenerative braking were not included in the TRATIM approach, instead of being dealt with by way of agreed standard discounts to gross consumption.

New methodology

The methodology we proposed for new or re-routed stock is therefore an attempt to mirror the TRATIM approach as closely as possible, as requested by ORR, while avoiding some of the main problems identified in our original EC4T consultation for the 2008 periodic review. The key steps are set out in the table, below.

¹³ This methodology was agreed in May 2009.

Steps to calculate a new modelled consumption rate

Step	Action
1.	A service pattern is selected as 'representative' of the service code for which a new consumption rate is required. The service pattern is selected on the basis of it being the most frequent i.e. containing the most trains ¹⁴ .
2.	The selected service pattern is modelled in Railsys ¹⁵ to derive mechanical energy at the wheels. This is derived using the following assumptions: <ul style="list-style-type: none"> • Trains modelled are based on the timetable period during which they are running; • Maximum braking rate of 1m/s²;¹⁶ • Trains are run flat out and weighting factors of 5% and 8% energy reduction are applied to AC and DC traction respectively to reduce the line energy consumption. (This is to take into account the effects of operational and engineering allowances etc.)¹⁷
3.	The mechanical energy is converted into electrical energy. In doing so, the auxiliary load while in traffic is calculated and added ¹⁸ .
4.	To reflect energy consumed during station dwell time and terminal layovers the final numbers are uplifted by 10% ¹⁹ .

Distribution losses for both AC and DC operation are not included in the rates calculated. This is consistent with the existing TRATIM methodology. Transmission losses are, effectively, dealt with in the annual year-end volume wash-up. Similarly the impact of regenerative braking is not included. However, a discount is offered to those operators which use regenerative braking.

From this process a consumption rate (kWh per train mile for multiple unit operation, kWh/gross tonne-mile for loco-hauled operation) can be derived for the following level of detail:

- Train operating company;
- train service code; and
- rolling stock type.

In addition, consistent with the TRATIM methodology, modelled rates can be derived for coupled multiple units (e.g. where two 4-car EMUs are operated together) by multiplying the single EMU rate by existing uplift factors²⁰.

Comparison with TRATIM

¹⁴ Where there is more than one service pattern in a service code with the same number of trains, an average of the most frequent service patterns is taken.

¹⁵ This is a performance modelling tool.

¹⁶ A braking rate of 1 m/s² is identified as appropriate as this value is commonly used as a standard maximum for new rolling stock types derived from Railway Group Standards. (It is understood this is slightly lower than some of the braking rates that were applied in TRATIM however it is regarded as being more representative of the likely maximum braking that would be applied in real-world operating conditions)

¹⁷ This is consistent with the original approach followed under TRATIM

¹⁸ Data on the electrical characteristics of individual trains is taken from OSLO

¹⁹ Note: TRATIM numbers were uplifted to take account of this consumption however there is no specific value identified in the assumptions. The 10% estimate is based on best available advice from Network Rail.

²⁰ Uplift factors are 192% for 2x1MU, 285% for 3x1MU and 380% for 4x1MU.

While a comparison between the new rates and TRATIM rates should not be used as a test of accuracy, it is useful as a means of demonstrating consistency between the two approaches. As such, a validation exercise was undertaken to compare the rates derived for selected types of rolling stock/route against the existing TRATIM rates. This validation exercise illustrated that, in most cases, the rates derived using the new methodology were within 5-6% of comparable TRATIM rates. It is, therefore, considered that the new rates are as consistent as reasonably possible with those derived using the original TRATIM approach.

We consider that it is suitable to continue using this methodology to calculate modelled consumption rates for new vehicles introduced during CP5. We would expect for most new stock introduced during CP5 to be fitted with on-train meters, and therefore opt for metered billing. For this reason, we would expect the use of this methodology to diminish over time.