V/TE SIC
Vehicle / Train Energy
System Interface Committee (V/TE SIC)

Tony Mercado
Chair, V/TE SIC
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Richard Gusanie
Office of Rail Regulation
One Kemble Street
London
WC2B 4AN

Dear Richard

**Response to the PR13 First Consultation**

The work undertaken by the VTE SIC titled "Macro energy risks affecting the railway in Great Britain" has highlighted the scale of the potential challenge the GB Rail Industry faces as energy prices increase.

We note that the electrical supply industry is adapting new strategies to manage the increase in demand for electricity and the change in electricity generation strategy to increase the amount of electricity generated from renewable sources. Furthermore it is understood that the electrical supply industry is already planning to install smart meters in every household by 2020 to enable time differentiated pricing of electricity.

Rail is one of the largest single consumers of electricity in the UK. Because the peak in electricity demand nationally coincides with the demand for rail travel electric traction on electrified rail could be particularly hard hit by this approach to energy charging.

The on Train Metering (OTM) minimum requirements are documented in GM/RT2132 (which is itself based on the Conventional Rail Rolling Stock TSI and the revised draft of BS EN 50463). This specification allows for a relatively wide accuracy range, (1.5% for AC and 2% for DC supply systems) and a relatively slow energy consumption reporting interval (every 5 mins)[1]. This means that a train travelling at a not untypical speed of 160 kph (covering 2.67 km per minute) will report single energy data points at about 13 km intervals. On the 750 VDC electrified railway substations can be less than 3 km apart, thus this single measurement point straddles 3 or 4 substations giving very limited (near to useless) understanding of the energy used across the railway.

GM/RT2132 and the conventional rolling stock TSI expressly allows for shorter sampling periods, hence supplementary data at shorter time periods for purposes other than billing is permitted. Currently, I believe most off the shelf on-board metering systems for billing purposes can provide a minimum time period of circa 30 seconds.

[1] High accuracy tariff meters are used to bill EC4T energy purchased to within an accuracy of 1%, and are read every clock-face half hour.

Understanding what (volts, amps) and where (geographically) energy is consumed on the rail network to a resolution accuracy of approximately 1 km will have many benefits. These include:

- a better understanding of energy use and therefore current capacity headroom within the electrification network,
- an accurate understanding (profile) of the locations at which electrical losses occur in the railway system,
- providing the railway industry with greater EC4T charging flexibility by keeping options open to reflect the uncertainty of the future (this is aligned with OFGEM in their RPI-X @20 review),
- the geospatial information about where energy is used would allow locations which have abnormal energy demands to be identified and investigated as part of an overall asset management strategy,
- providing actual detailed data from which to develop traffic management strategies which optimise both the train timetable & the overall energy consumption, and
- the ability to identify locations where poor rail adhesion is reducing the performance of regenerative electric braking, and the impact this has on regenerated energy available to the rail network.

**Conclusion**

V/TE SIC strongly support the wider fitment of OTM, but believe that greater long-term value to the industry could be achieved by enabling the recorded OTM input values of voltage, current and location being provided at an increased sampling rate. This could be achieved with existing OTM's if industry incentives existed for the collection of this data. These measures will help address the future challenges of increasing energy costs and reducing rail industry costs as identified in the McNulty Value for Money study.

Should you wish a more detailed discussion on this topic please feel free to contact me.

Yours Sincerely

Tony Mercado
Chair, V/TE SIC