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Mr Alan Price
Office of Rail Regulation
One Kemble Street
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17th November 2014

Back-up proposal for Crossrail Train Protection (Paddington to Airport Junction)

Dear Sir,

Crossrail is a critical infrastructure project that, when fully operational, brings many safety benefits, including reducing overcrowding and introducing new, modern rolling stock.

As a key aspect of the project, we have been working closely with Network Rail on their development of ETCS Level 2 between Paddington and Airport Junction. Our baseline assumption is that we will be using ETCS L2 and we are fitting the new Crossrail rolling stock with the appropriate equipment to accommodate this.

We acknowledge that Network Rail is implementing a rigorous process to manage the risks associated with the ETCS fitment, but considering the reliance that Crossrail has on a train protection system being in place for Stage 2 in May 2018, we are very supportive of an approach that provides an alternative should the ETCS programme be delayed.

Network Rail is proposing a back-up solution utilising enhanced TPWS train protection, which we anticipate will be compatible with both our technical interfaces and operational processes. This is, in our view, a prudent and appropriate option to pursue and is now the subject of a formal request for an exemption under Regulation 6 of the Railway Safety Regulations 1999. As part of the development of this exemption request, CRL was requested to consider some points raised by the ORR at the pre-exemption application meeting held at the ORR offices at Kemble Street on 15 October 2014.

1. *Identify the engineering and timescale impacts on the delivery of the Crossrail train and the effects that incorporation of the GW-ATP system would have on the Crossrail project overall.*

We do not believe this is a practical or feasible option, for the following reasons:

A. An order placed now for GW-ATP equipment is very unlikely to be capable of being delivered in the timeframe required

B. Bombardier (the train manufacturer) has advised that they are unable to fit the ATP driver console equipment in the cab as designed. Considerable effort has already been expended on creating an ergonomically efficient and driver-friendly cab - including the interfaces to train control computer screens. Inclusion of this equipment on the Crossrail train at this stage of the design would necessitate a significant redesign of the cab and man-machine interfaces which will incur delay to the delivery schedule for the train.

C. Bombardier has also advised that they are unable to fit the ATP equipment cabinet in the driving cab due to insufficient space. Fitment would likely require this equipment to be located in the saloon, which is inappropriate given the safety critical nature of the equipment.

D. GW ATP, as it is deployed on the IEP programme, is simply a standalone parallel system and is not designed to work using ETCS as the master protection system. Because of the need to manage transitions to the Central Section CBTC/ATO system, fitment on a Crossrail train would require this to be changed, which represents a considerable technical development risk.

E. In addition to the above significant development risk a transition between CBTC and GW ATP will certainly delay timescales due to the level of additional testing required.

2. *Impact of delay to introduction of Crossrail services*

There are significant safety benefits that would be deferred should Crossrail be delayed as a result of ETCS programme delays.

A. Replacement of existing Class 360 rolling stock (built 2005) and Class 165 rolling stock (built 1992) with new rolling stock built to current crash worthiness requirements

B. Provision of significant additional passenger carrying capacity between Hayes & Harlington/Southall and Paddington – currently this section of route has 3 of the 10 most crowded trains in the UK (Autumn 2013 figures)

C. Alleviation of overcrowding on the London Underground Central/District Lines through the provision of additional capacity from Ealing Broadway

D. The DOO CCTV system being installed for the dispatch of Crossrail trains conforms fully with the recommendations of recent RAIB reports (Brentwood, Charing Cross, St James, Liverpool and Holborn incidents) in providing means of stopping trains when leaving the platforms unlike existing National Rail DOO train dispatch methods in use on the route.

E. A delay to implementing Stage 2 would impact the commencement of full Crossrail operation at Stage 5 (Integration of Heathrow, Maidenhead and Reading services into the Central Section). This would perpetuate the need for large numbers of passengers to change trains at Paddington to continue their journey via Crossrail with a consequent increase in Slips, Trips and Falls incidents.

F. The doubling of frequency of the existing Connect service to a four trains per hour local service to Heathrow will encourage increased use of public transport to the airport and reduce the safety risks arising from use of road transport for these journeys.

In summary, our view is that introducing GW-ATP at this stage of the project raises a considerable number of high risks, including supply chain procurement, ETCS interface, a fundamental redesign of the cab layout and a minimum of 6 months delay.

Delay to the introduction of Crossrail would, we believe, be counter-productive to the overall safety case as it will defer the significant safety benefits that come with new rolling stock, alleviation of crowding, DOO CCTV and reduction in the amount of road traffic.

We are committed to supporting Network Rail in any development work required (both technical and operational) to ensure that the TPWS-enhanced alternative is demonstrated to be a robust solution from both a safety and performance point of view.

Yours Faithfully

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