

Adverse Event Notice - update

Purpose

This note provides an update to Sponsors following the Adverse Event Notice (AEN) of 7 July 2017 served by Crossrail Ltd (CRL) regarding:

- Uncertainty of the timely development of on-board signalling and train control management software by Bombardier Transportation UK Ltd (BTUK) under the Rolling Stock and Depot Service Provision agreement between BTUK and Rail for London Ltd (RfL) dated 18 February 2014

This update follows a period of continuing collaborative working between CRL and RfL in line with the activities outlined in the AEN, and discussions at the CRL Board on 20 July which considered the current position of the Bombardier programme and implications for Stages 2 and 3 delivery.

A number of actions have been taken by CRL, RfL and BTUK including:

- BTUK has increased resources, engaged more rigs, enhanced their TCMS team, strengthened their reporting through weekly KPIs (which are shared with CRL); and there is now more intense senior management engagement
- BTUK has undertaken a Quantitative Schedule Risk Assessment (QSRA) on their programme. The QSRA methodology used by Bombardier was reviewed by CRL. The P80 dates for software development were shared with CRL and have been used to inform any updates required to the programmes for delivering Stages 2 and 3 in line with the notified dates and the development of any fall-back plans and risk mitigations
- CRL has appointed a Stage 2 Programme Integration Manager
- Relevant lessons learned from Stage 1 commencement will be adopted by Stage 2
- The four-weekly Crossrail Programme Delivery Board is being recast to focus on Staged opening

Stage 2

The current assessment is that the Stage 2 date for passenger services remains achievable but challenging (Plan A). However, uncertainties remain, further slippage may occur and it is prudent to develop a fall-back plan. A decision would be required before December as to whether to enact the fall-back plan. To do so would require Sponsors' endorsement as the fall back plan would not be fully compliant with the affirmed opening strategy for Stage 2.

An action plan has been developed to progress mitigation measures for Plan A and fall-back actions in case of the need to enact the fall-back plan. Leads and timescales have been given to each activity, which are already being progressed.

The fall-back plan involves:

- 2 tph Class 360s running between Paddington and Heathrow
- 2 tph Class 345s (full length units (FLU)) running between Paddington and Hayes and Harlington)

Activities required to ensure the fall-back plan can be enacted include:

- Agree alternative timetable (2tph C360s PAD-LHR; 2tph C345s PAD to H&H)
- Agree retention of Class 360s, any necessary franchise changes and commercial agreements and maintenance agreement with Heathrow
- MTR agreement to drive C360s Heathrow to Paddington under the existing concession with TfL or continuation of Heathrow Connect
- Agree Bombardier scope change for C345 FLU (configure FLU for TPWS only operation)
- Ensure NR deliver bay platform extension at Hayes and Harlington

Stage 3

The current assessment is that the Stage 3 date for passenger services remains achievable and consistent with our Master Operational Handover Schedule (MOHS) that includes dynamic testing commencing in Zones 1 & 2 in November 2017.

However, it is challenging and further date slippage in software development and testing may occur which would cause instability in the MOHS and have potentially serious schedule and contractual implications. As a consequence a number of alternatives and risk mitigation activities are being considered and developed and decision points between late August and December have been identified.

The intended approach is as follows:

- RfL will continue to hold BTUK to deliver R7.0 Train Control Management Software (TMCS) for dynamic testing commencing 1 November 2017. This is likely to be an early version with a full release by 2 December 2017
- If it is understood in late August/early September 2017 that a stable R7.0 train will not ready by the end of October 2017, two decisions will be considered:
 - Revert Zones 1&2 tunnels back to construction and recommence dynamic testing in late January 2018 with a stable train; or
 - Switch to a CBTC-only (R5.2) version and commence dynamic testing in February 2018
- Those decisions will fall to be made by the CRL Board
- If no stable train is available by late January 2018, construction activities continues up to Zones 1-4 testing commencement at the end of February 2018
- Develop other mitigations, including acceleration of testing; longer hours/more days; separate mileage runs and a shorter but more intensive period of driver training.
- Develop a more progressive approach to the Handover of the Central Operating Section from CRL to RfL to reflect potential ongoing signalling reliability growth activities through Trial Running and Trial Operations in July and August 2018

CRL and RfL will continue to work collaboratively on these issues. The issues are dynamic and being closely monitored. A further update will be provided at the Sponsor Board meeting on 15 September. In the interim CRL and RfL teams are happy to provide further detail and any clarification sought, through the Joint Sponsor Team.

31 July 2017