To,
10.2.e
Gemeente Amsterdam
Metro & Tram
Amsterdam

Your ref:
Our ref: 70089825
18 November 2021

Dear Sir,

Subject: WSP's review of the Amsterdam Metro Project in relation to re-start of CBTC commissioning in Oct'21

Amsterdam Metro project team have commissioned WSP, UK Limited to carry out a project review following multiple incidences of Global Hold between April 21- Sept 21.

As part of the review, WSP UK carried out a preliminary assessment of the project to advise on restart of the CBTC commissioning. WSP had taken a risk-based approach based on its experience on similar complex signalling programmes around the world. The review comprised of interviews of key individuals from programme (S&C), Operations (GVB) and the supplier (ALSTOM); and the information supplied as a result specific questions generated during the review process. This included root cause analysis of recent Global Holds, details of previous Global Holds (Feb – June 21) and Open defects.

WSP UK submitted its report to Amsterdam Metro project team on 21/10/2021. In the review, no technical safety issues were identified. However, some procedural lapses were identified. Following the project review, WSP UK made a number of recommendations, mainly focussed on improving operational resilience of the system.

Recommendations (Short Term):

1. *Project should carry out further lessons learned exercise for each Global Hold considering additional aspects and situation on the day including people, technology and systems limitations to draw a resilience plan for future*

2. *More detailed plans should be put in place to allow quicker recovery in case of failures. This includes increased ALSTOM technical support on site.*

3. *Duration of technical support should take into account the learning curve of the field operations staff and should be target driven e.g. demonstration of RAMS*

Recommendations (Long Term):

4. *Project should carry out a workload review of key operations staff workload through an HF specialist team. This exercise should be repeated when there is significant change*

5. *Defect retirement plan should include a burndown of operational restrictions, workarounds and SRACs*

6. *Retirement of temporary fixes (patches) with a long- term solution*

7. *Project should consider bolstering recovery plans. For example, possibility of containing the impact of Global Holds to a smaller section rather than whole network, the response time of 2nd line and 3rd line maintenance support or providing server loading level alarms to enable manual switchover and reboot*

8. *A training plan including refresher courses for the field operations and maintenance staff*

Following a discussion with project team on 9th Nov 21; WSP understands there is an emergence of technical issues related to the Customer Information System and Wheel Slip/Slide. Although the issues such as wheel slip/ slide resulting in emergency brake applications is not a pleasing experience for the passengers, it is a safe system behaviour and avoidance of such instances could be managed as part of the maintenance regime based on weather condition. This seasonal problem is common on railways in other similar climates and is managed in a similar way.

It is worth noting that encountering new issues during implementation of an integrated control system like CBTC is not an unexpected phenomenon. Whilst most of the technical issues are resolved during systems testing but some issues arising from operational conditions and change in environment are likely to escape normal system testing and would manifest during actual operation.

It can take several years once the system is fully operational to identify all the technical issues, especially in a brownfield migration like Amsterdam metro. It is common practice to manage these as a combination of operational procedures, maintenance regime, training, and technical solution. This requires continuous proactive monitoring and management between the project/supplier and operator to quickly identify issues that impact operations and implement short term and longer term solutions.

WSP would be looking further into the issues recently encountered and make recommendations accordingly.

Yours sincerely,

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