

Vehicle fleet build out for 34 vehicles

The number of vehicles to provide revenue service was developed by the contractor in response to the capacity identified in the PA, plus 2 available protective spare vehicles and 2 vehicles unavailable due to required maintenance. That fleet count was proposed at 30 vehicles plus the 4 spare vehicles. With the requirement to maintain the protect spares ready for service, this equates to an actual spare ratio of 6.67% which is quite low, especially considering the service is intended to run the vehicles in pairs.

The latest proposed schedule* shows:

- 32 vehicles available by November 30, 2018
 - Two of those vehicles are not programmed to be accepted until November 30, 2018
- One vehicle programmed for acceptance on December 11, 2018
- One vehicle programmed for acceptance on January 30, 2019

* *It is believed that this schedule does not consider the unavailability of the final two sets of Thales onboard equipment has been considered in this proposal. It was previously cited that this equipment would not be available until March 2019, which would further delay the availability of the final two vehicles.*

Per the proposed schedule, the spare ratio at November 30, 2018 would, at best case, be 0%. The demands of scheduled and unscheduled maintenance would be expected to first eliminate the ability to maintain the available protect train, adversely impacting the recovery from an in-service failure. Further maintenance demands would impact the ability to operate a full train schedule.

Additionally, the schedule includes the performance of Overall Acceptance Testing for 30 vehicles over a 7 calendar day period. This process was originally staggered over a two month period.

Vehicles Testing and Commissioning

For the acceptance of a new vehicle fleet, traditionally months of extensive testing in real operating condition is performed to identify latent design issues. Without such testing, latent design issues would be expected to become apparent present after start of service. Depending on the criticality, such issues could drive up the unscheduled maintenance activities, decreasing the fleet's number of available vehicles.

A related issue is the seeming inability to operate the vehicles in two vehicle trainsets. This would most likely indicate a trainline network issue. If this is the case, then interoperability testing of two vehicle trainsets cannot be truly initiated until these issues are resolved.

Additionally, each vehicle would have been required to operate failure free (burn-in) for 500 – 1000 km to identify early life component failures. Without a robust vehicle burn-in, these failures will occur after the start of service, again decreasing the fleet's number of available vehicles.

Maintenance Readiness

As a new maintenance provider, it is not expected that the maintainers have the experience to efficiently troubleshoot or maintain a new fleet of vehicles. It has also been stated that the inventory of protective spare parts is not at the level desired to maintain service. Together, these two issues will increase the Mean Time To Repair (MTTR), which is an indicator of how fast a defective vehicle can be repaired and

made available for operation. An increase in MTTR also decreases a fleet's number of available vehicles adversely affecting the ability to operate a full train schedule.