Case Study

Maintenance optimisation of GB passenger trains

Frazer-Nash Consultancy was asked to review the maintenance of Diesel Electric Multiple Unit passenger trains for Bombardier Transportation. The objective was to review the maintenance schedule and frequency, so that Bombardier could optimise its maintenance resources and depot capacity.

To support this, we completed a review of component failures, to establish which materials needed to be replaced outside of scheduled maintenance. If components failed between maintenance, this would indicate that additional maintenance was necessary or system improvements were required.

REVIEWING RELIABILITY DATA

We used fleet reliability data to establish the causes of failures, and the type of failure was also considered, such as a delay or cancellation. The failure modes of components were identified by observing parts in the depot, speaking to maintenance staff, or from expert knowledge.

If there were no component failures, or very few, there was a likelihood that the maintenance period could be successfully extended for that particular maintenance activity. A risk assessment was also undertaken to establish what would happen if the maintenance schedules were reduced.

Several Failure Mode Effect and Criticality Analyses (FMECAs) were undertaken. Each FMECA detailed the number of failures experienced on a particular system and the actual impact to the service. A score was taken from each FMECA which enabled us to assess the risk of changing the maintenance.

As a result of this work, the client was able to extend the period between maintenance schedules for a significant number of activities. In addition, further investigations were undertaken to discover the causes of system failures or the degradation of components. This will ultimately improve reliability and improve the passenger experience on trains operated around Great Britain.

ADVANTAGES OF ADOPTING THIS APPROACH

- Reduction in maintenance schedule leading to significant cost savings
- Time savings enabled additional trains to be maintained
- Component studies leading to improved reliability
- Improved understanding of failure modes
- Early identification of failures
- Increased revenue from additional train in service
- Increased depot capacity.

Client

Bombardier Transportation

Business need

Provide space in a busy maintenance schedule for an extra train to be maintained. To achieve this, Frazer-Nash needed to fully understand the implications of any reductions in the maintenance schedule, whilst ensuring reliability targets would be achieved.

Why Frazer-Nash

The project demonstrates Frazer-Nash's expertise and specialist background in appraising rolling stock systems, predicting failure modes and improving reliability. We ensure any changes are risk assessed by personnel with domain knowledge, taking into consideration the impact on performance levels.

Date project completed

July 2016

A Bombardier Class 221 Tilting Super Voyager at Central Rivers Depot.

Find out more

To find out more about our work and how we can add value to your business visit our website.

FRAZER-NASH CONSULTANCY