

ABSTRACT

This research was conducted to investigate factors affecting acquisition of rolling stock, specifically bogies through lifecycle of rolling stock, and developed a conceptual framework for Transnet Engineering Product Development (TE PD) to assist in the acquisition of bogies through lifecycle of rolling stock.

A review of the literature with focus on rolling stock, new product development, lifecycles, systems engineering, architecture frameworks, logistics, and project management was conducted. The first draft of the framework consisted of 37 viewpoints. It was developed by adapting Ministry of Defence Architecture Framework (MoDAF)(Caruso et al, 2010) and Department of Defence Architecture Framework (DoDAF)(DoD, 2007) architecture. The framework was developed along with a checklist matrix with 32 factors affecting the acquisition of bogies through lifecycle of rolling stock.

Research was conducted using a Likert survey and archival research to evaluate current acquisition processes and identify problematic factors affecting acquisition of rolling stock within TE PD. The survey reached a response rate of 60.0% (42 respondents). The survey was used to rank the issues affecting acquisition of rolling stock within TE PD from the perspective of former and current employees of TE PD. Then, archival research was conducted by going through two main project document templates that were used for all the projects considered for this research. The archival research found that each projects followed process as per intent, but the process could benefit greatly from introducing new templates such as a standardised acquisition lifecycle process, SEMP template, WBS template, ConOps template as well as the check list matrix. This was followed by semi-structured interviews conducted with subject matter experts to give their critique of the first draft of the conceptual framework.

A final framework updated from the input from subject matter experts is presented with a total of 41 viewpoints. Pareto Principle, which states that 80% of problems are caused by the top 20% of the issues, was used to pick the top 21.8% of the top acquisition issues according to the survey responses and interventions proposed by the framework to address these critical issues.



10/05/2023