A Framework for the Involvement of the Maintenance Manager During the Design Development and Review Stages

Abstract

Virtually, there exists no feedback between the maintenance manager and the integrated design team. Such feedback, if provided, would result in reducing the challenges that are attributed to faulty design, and faced by the maintenance manager during the operation and maintenance phase. This research aims at (1) identifying and assessing the most significant operation and maintenance problems that commonly emerge as a consequence of the maintenance manager's lack of involvement during the design development and review stages, (2) Identifying and assessing the major concerns and/or details raised by the maintenance manager at different design stages, (3) investigating the current practices of the maintenance manager's involvement, and (4) developing a framework to prioritize the major concerns and/or details raised by the maintenance manager during the design development and review stages at the most significant project design phase. A series of sixty six operation and maintenance problems and eighty five major concerns and/or details for different design disciplines were identified depending on literature review and interviews with the directors of maintenance department divisions of two universities namely, King Fahd University of Petroleum and Minerals and Dammam University. The operations and maintenance problems and the major concerns were assessed, and the current practices of maintenance manager's involvement were captured through developing; testing and administering a questionnaire survey to the maintenance departments of thirteen public Saudi Arabian universities. The findings confirmed the importance of the identified problems and concerns, where all problems and concerns were assessed as either "extremely important", "very important" or "important". After the analysis of the questionnaire survey, 60% of project design stage was determined to be the most significant project design stage. This stage necessitated the identification of forty three major concerns. The framework was developed based on these concerns. It required developing a scoring matrix and performing a pair-wise comparison for each of the concern by three experts. The power method applied to Eigen-value method was used to check consistency of data analysis. The 't' test using spearman (roh) correlation was applied to investigate the correlation between the experts and directors of maintenance divisions who ranked the forty three concerns.