

***WAREHOUSE DESIGN: A SET THEORETIC APPROACH**

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ABSTRACT

Allocation and assignment of spare-parts is a vital problem for sound operation of a warehouse. Miss-allocation of spare-parts takes huge time to find parts out. This problem causes extra time consumption and money expenditure for the involvement of labor for long time and also creates risk of unavailability of spare parts which lead to improper maintenance or repair of machines. The existing system calls for the location of items in alphanumerical order without regard to issue frequency, size, weight or volume. As a result the plant faces problems in issuing/retrieving the spare parts with minimum waste of time & effort. This paper presents an algorithm based on set theoretic approach for spare parts allocation and assignment in a warehouse of a Barge mounted power plant in Bangladesh. The proposed algorithm classified 4,000 (four thousand approximately) items into 56 (fifty six) spare parts family. A spare parts family is a superset of spare parts required for a particular type of maintenance over the last period of time. The algorithm also calculate the weight for each spare parts family which is the summation of all item's frequency of usages in a year. The weight is used to identify a family as slow or fast moving. Fast moving families are kept near to issue counter. The effectiveness of the proposed algorithm is evaluated by comparing the total transport work and travel distance with respect to present system. It is found that the rearranged system with the help of the algorithm reduces the transport work by 76% and travel distance by 50% approximately. This indicates that the proper allocation and assignment of spare parts will increase the system's performance significantly.

Key Words: Allocation, assignment, spare parts, retrieval, total transport work, travel distance, group technology.

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