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A case study of spare parts inventory management system of packaging industry

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Spare parts inventory is vital to for smooth production processes and increasing equipment uptime. It is always complex to manage spare parts inventory because of its higher number of varieties and lower demands. The purpose of this study is to identify the spare parts inventory that needs stringent control and ensure an economical and optimal quantity level for each part to avoid stock out situation. We gathered main data containing the number of items, annual consumption and prices of each item from the logbook of the technical store of the company. Each item and its numbers were physically verified from the store. The data related to the criticality of items were gathered through interviews of lower and middle staff of the technical store, production and purchasing departments. The expenditures and consumption of spare parts items were analysed using ABC analysis, whereas to identify critical items, we used VED analysis. ABC-VED matrix is another inventory management technique, which combines the effect of both ABC and VED analyses to cover the limitations of individual ABC and VED analyses. Furthermore, Economic order quantity (EOQ), Re-order point (ROP) and Safety stock for each item were calculated. ABC analysis shows that 18.78% of total items fall in category "A", 25.15% in category "B" and 56.36% in category "C" accounting for 70%, 20%, and 10% of total annual expenditures of year 2016/17 respectively. In VED analysis, 32.12% of total items were identified as vital "V", 57.57% as essential "E" and 10% as desirable "D". Whereas ABC-VED matrix analysis divided items in three categories. Analysis shows that category I have 37.38% of total items, category II 55.45%, and category III only having 6.97% accounting for 82%, 17.36%, and 0.64% of total annual expenditures, respectively. It was found that the values of EOQ, Re-order point and Safety stock were much smaller and therefore, ignored for spare part items in the study. Considering the rate of consumption, criticality level, lead time and ordering cost, 16 items were identified as dead stock and removed from spare parts inventory. Based on the above analyses, a new subjective method is presented in the study to manage spare parts inventory having intermittent demand. The new applied method is a periodic review multilevel control methodology based on the results of ABC-VED matrix analysis. The benefit of the study is the elimination of dead stock from the inventory, avoiding stock out situation and rationalize the buffer stock. Keywords: Spare Parts Inventory, Packaging Company, ABC-VED matrix, Dead stock, Re-order point