



SPARE PARTS MANAGEMENT

The nuanced decision-making involved in spare parts management is often overshadowed by the high cost of down time in pharmaceutical manufacturing. The impact of this downtime is then met by another high cost, inventory, creating a delicate balance of minimizing the risk downtime while controlling costs. The typical result is an inordinate inventory value accompanied by the standard issues facing non-critical storerooms, such as inventory accuracy and stockouts. This article looks to highlight the importance of four Key Performance Indicators to help any manager or executive better control costs and minimize downtime: Carrying Costs, Excess Inventory, Emergency Purchase Ratio, and Open Purchase Orders versus Below Minimum Stock.

These four KPIs offered invaluable insights for a recent project aimed at optimizing storeroom efficiency. During this initiative, we assessed storerooms to identify and eliminate obsolete parts, and associated remaining parts with specific bills of materials. This evaluation ensured that every part retained in storage was essential and relevant, thereby streamlining inventory management.

Carrying Costs

Carrying costs are the cost associated with keeping inventory on the shelves, to include storage, labor, transportation, handling, insurance, shrinkage and depreciation. The proportion of carrying costs can vary depending on the industry and the size of the company but typically ranges between 20-30% of the total inventory value. Given the complexity of evaluating these costs on a per-part basis, a more feasible approach is to estimate them at the storeroom level. For example, calculating 20% of the total inventory value can provide a reasonable estimate of the carrying costs. Keep this number as low as reasonably achievable by reducing excess inventory, controlling who can add spare parts, and removing parts without movement in 5 years. This is not applicable for emergency/critical spares.

Excess Inventory

Excess inventory, defined as stock exceeding the maximum quantity for active parts. Another consideration for calculating excess inventory would be to assess the min/max quantities against actual usage. For example, if typical cadence is to use the part once a year, it would not make sense to stock 10 of this part. The presence of high levels of excess inventory leads to a series of inefficiencies, including the waste of resources in cycle counting, elevated holding costs, and a decrease in net working capital.

Our inventory evaluations have frequently revealed substantial excess stock in storerooms. A primary reason for this accumulation is the lack of consistent and thorough evaluations of the necessity of parts. This oversight often occurs because when parts are allocated to storerooms, adequate attention is not given to ensuring they are correctly linked to the bill of material for the relevant equipment.

Consequently, storeroom management faces difficulties in removing materials that become irrelevant when equipment is replaced or decommissioned.

The key contributors to excess inventory are untimely returns, poor kitting practices, and lack of proper end of life planning for assets.

Emergency Purchase Ratio

The Emergency Purchase Ratio (EPR) is a crucial metric that measures the proportion of unplanned (emergency) purchases relative to planned ones. While it is inevitable for companies to occasionally make unplanned purchases due to unforeseen circumstances, a high frequency of such purchases often signals an inadequacy in the procurement strategy.

To minimize the EPR, it is essential for organizations to perform periodic investigations into the emergency purchases to understand the underlying reasons for the emergency – whether it is due to non-stocked materials, insufficient stock levels, lapses in maintenance planning, or other factors. Gaining a clear understanding of the causes enables the organization to implement corrective measures, thereby reducing the likelihood of similar emergency purchases in the future. This proactive approach is not only about addressing immediate needs but also about refining procurement processes for long-term efficiency and reliability.

Open Purchase Orders v Below Minimum Stock

This Key Performance Indicator (KPI) is essential for monitoring the balance between open purchase orders and stock levels that fall below the minimum requirement in a storeroom. In an optimally functioning Maintenance, Repair, and Operations (MRO) operation, each active part that dips below its minimum stock level should be matched with an open purchase order to restore stock levels to their max level. Regularly reviewing this KPI allows for effective maintenance of minimum stock levels and early identification of problematic parts, thereby preventing them from leading to stockouts.

Neglecting this metric can significantly increase the risk of a facility experiencing a stockout. This risk is heightened by various potential issues in the ordering process that can impede the fulfillment of a purchase order. These issues include changes in part numbers, inaccuracies in data submission, requirements for customization, shifts in suppliers, part obsolescence, and often a lack of technical knowledge or background by the individual handling the order, who may not be the end user of the part.

Below is a high-level synopsis of the use of these metrics in our evaluation of the aforementioned storerooms:

Carrying Costs - Carrying costs during this process was not initially a KPI that was being actively evaluated outside of the inventory management group. During the project this value was used by the project team to perform min/max evaluation of the top 25% of inventory based on cost. This resulted in an annual saving of approximately 5% of total inventory value annually, to include both reduced inventory levels and associated carrying costs.

Excess Inventory - items identified as having excess inventory contributed to 4% of total inventory value. This was found to be largely due to lack of control over storeroom transactions: specifically returns. A large number of soft goods were in excess of inventory because large jobs were planned,

stock was removed from inventory automatically, jobs were cancelled/postponed, and stock was returned with no transaction to return them to inventory. Additionally, a significant amount of “excess inventory” was for items no longer required or had no use case on site. These were mainly associated with a product line that had previously been ended, however due to insufficient decommissioning processes, significant spares were left in storerooms.

Open Purchase Orders v Below Minimum Stock - The value of assets that were below minimum stock levels were found to be near to 5% of total inventory value, these were largely due to procurement issues that were not resolved in timely manner, such as data accuracy, changes in vendor information, effects of vendor acquisitions, and other issues regarding part obsolescence.

Emergency Purchase Ratio - The Emergency Purchase Ratio was not directly evaluated as the value of Planned versus Emergency Purchases was not made available, however the number of emergency purchases in a specific time period was available. These materials purchased via an emergency purchase were found to have significantly less classification information (size, weight, power, etc) which often resulted in future purchase issues. The on-site Asset Management team members have now begun tracking ERP by value and number of transactions for future evaluations.

In summary, by effectively managing these KPIs, pharmaceutical manufacturing companies can significantly free up funds and reduce the costs associated with maintaining spare parts inventory. Using this holistic approach may not be the answer to all the problems of your storeroom, but it can provide valuable insight that can lead to actionable projects with minimal effort.

