Inventory Accuracy

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Inventory accuracy is an important metric for any business that deals with on-hand stock. For a distribution center or retail location, they need to know that the inventory reflected in their inventory management system is correct so that they can feel confidence in being able to satisfy a customer order. For a manufacturing facility, inventory is obviously needed to build and ship product. When unplanned stock-outs occur, the manufacturing floor is forced to changeovers machines, shift production schedules and potentially miss customer deliveries.

This is exactly what was regularly occurring at a tier 1 automotive supplier. Yet, they claimed they had a 98% inventory accuracy. How could a system that had that level of accuracy run out of materials so frequently? They answer was simple, they didn't use an effective means of measuring inventory accuracy.

They had the right systems in place, including utilizing bar code scanners to track material receipt, movement and issue, a back-flush transaction within their production reporting and a cycle count program. So the support systems were in position and since their inventory accuracy was well above the their 95% goal, they assumed those systems were all functioning properly. Yet they kept running out of material on the production floor. The material management team blamed the problem on the production floor, claiming they must be wasting too many parts and not performing the scrap transactions.

The issue was that they were using a simple calculation to measure inventory accuracy that masked the problems. Following a cycle count, they would complete the following calculation.

$$\left(1-\frac{|total\ value\ of\ counted\ inventory-total\ value\ of\ counted\ inventory\ shown\ in\ system|}{total\ value\ of\ counted\ inventory\ shown\ in\ system}\right)100$$

While this is an accepted formula to calculate inventory accuracy, it is best used in a distribution center or retail location. The problem with this method for a manufacturing facility is that the more expensive items dramatically skew the results. In the case of this automotive supplier, they were very careful with the high dollar items, not only storing them in a location that had controlled access, but also tracking them on the production floor and stressing to everyone their importance and value. While it makes sense to carefully monitor expensive stock, to utilize this "value-based" inventory accuracy measuring approach, it gave the material management team a false sense of confidence in the work they were doing overall.

For this manufacturer, the issues were not with the expensive parts, but the less expensive ones. Those were the ones that they were constantly running out of; the nuts and bolts and pieces of raw material. Their inventory accuracy measuring method was not depicting a true representation of the on-hand stock in terms of what was needed to meet production needs.

To fix this, the first proposal was to simply switch from using the values of the items that were cycle counted to using the actual count of the items that were cycle counted. That calculation looked like this:

$$\left(1-\frac{|\ total\ of\ coutned\ inventory-total\ of\ counted\ inventory\ shown\ in\ system|}{total\ of\ counted\ inventory\ shown\ in\ system}\right)100$$

The problem with this method is that the result can be skewed by items that have a high number kept on-hand. These could be items that can only be bought in large lots or items that are needed in high quantities for manufacturing. When this method was used to calculate inventory accuracy, the supplier scored a 94%. This result was still close to their 95% goal, so they still felt this was acceptable. Yet it still didn't account for why they were running out of parts so frequently.

What they needed was an inventory accuracy calculation method that would give them a true depiction of their inventory management system's ability to meet manufacturing needs. That was determined to the be "hit method". In this method of determining inventory accuracy, the accuracy of each item is calculated on its own based on count. If the item is within 5% of what the system shows, then that is considered a "hit" and is good. Otherwise, it is a "miss". The overall accuracy is then determined by simply calculating the ratio of "hits" to the total number of items counted. This equally weighs the importance of every component, regardless of value or on-hand amount. When this method was used, the manufacturer's inventory accuracy was 44%.

The materials management team was hesitant to accept this new measurement method, but agreed to consider how it would help. By looking at the "misses" and talking with manufacturing, they found that these were some of the items that were involved in the stock-outs. By shifting their mindset regarding accuracy, they began to reconsider all steps of their inventory transaction process and identified several opportunities for improvement.

First, it was realized that their cycle count system was based on item value and not on the rate of item movement. That meant that the results were still skewed by more expensive items that were in a controlled location and not used as often as higher moving components. Once the cycle count program was changed to focus on the more frequently used items, it took longer to conduct the cycle counts, but they were more representative of the overall system's accuracy.

Next, the overall process for inventory flow was reviewed and found to need improvements in the receiving process and in the movement transactions. The receiving dock was understaffed and frequently items were taken from the dock to be used immediately by production before being fully entered in the system. Later, as the receiving personnel were catching up, sometimes on subsequent shifts, they would enter transactions based on their memory or notes. These transactions were frequently inaccurate. Also, the inventory locations were poorly marked and so, as inventory was moved around, it was frequently not well recorded, making it difficult to locate material when needed.

Lastly, the bills of materials were reviewed and found not to contain any allowance for scrap. Although the processes routinely had some percentage of items that were waste, they were only accounted for in rare instances when a finished good was determined to be defective and scrapped out in the system. Otherwise, this waste went unaccounted for. The materials management team had suggested this was the problem all along with inventory accuracy, but they did not have good data to back up their assertions and so, no action was taken.

Now, armed with a new method of counting inventory accuracy, the facility overhauled their inventory processes and worked with production to add scrap factors to their bills of materials. The improvements are still in progress, but they have already seen a reduction in stock-outs and an increase in inventory accuracy. Once they meet their accuracy goal, they can be confident in production's ability to attain the

weekly production schedule and subsequent customer orders and then consider reducing safety stock levels to lower inventory carrying costs.