Effective Inventory Management

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Purpose

- August ANS UWC Conference
- Executive/Supply Chain joint session
- Multiple indications of growing executive interest in inventory levels
- Ground level input to a message to be delivered to your executives at this conference

Overview

$Billions in the closet and nothing to wear!

Inventory levels considered to be excessive

- How we got here
- Background information
- How we get out of here
- Opportunities
- Additional thoughts

$Billions in the closet and nothing to wear

- Competing demands for availability of materials to support plant operations and maintenance.
- Resultant "conservative" stocking levels and one-time purchases to ensure 100% parts availability.
- Materials not utilized are returned to stock and thus inventory levels continue to grow.
- High inventory levels a cause for concern in that they use up financial resources of a utility that could be better utilized elsewhere.
- Even with high inventory levels plant material needs are not always met.

How we got here

In the beginning:

- Construction left-overs were good and we are naturally hoarders for that rainy day
- 40 years of life meant forever
- No such thing as a merchant plant, recovery guaranteed for most
- Next worst thing in the world is a mechanic not having every part needed to repair an item in the field
- Worst thing is for Supply Chain to be on critical path
- 154 considered to be free money
- Just about everything was analog
- Management didn't care
- We were the young and restless

What has changed

- No longer wearing bell bottoms (unless they have come back again)
- We have gray hair and grandchildren
- No one uses a slide rule anymore
- Many of us are now in management and we care
- More and more of us are starting our careers

What else has changed

***As we approach middle and end of life*:**

- We still have 90% of those construction left-overs
- 40 years for some plants is just about over
  - 40 years for some is now 60 and maybe soon 80 years
  - Sinking funds of various sorts are being put into effect
  - Inventory is a potential stranded cost to the shareholders
- Merchant plants and others have no real recovery guarantees
- 154 for many is hard cash or at least a strong competitor for available funds
- We are management and we do care about inventory levels
- Computerization of planning activities can provide better mechanisms to identify material needs

What hasn't *really* changed

- Next worst thing in the world is a mechanic not having every part needed to repair an item in the field

- Worst thing is for Supply Chain to be on critical path

- Work planning wanting more parts than needed staged or at least on site and available

Why do we struggle with inventory levels?

- We have too much inventory to start with!
- We are culture based and slow to change.
- Current inventory analysis models are reactive rather than predictive.
- Existing inventory metrics are history based
- Reorder points and safety stock models are based on past usage and ultra conservative availability. A minimum +1 philosophy versus minimum on hand coupled with "safety quantity" against usage will accomplish reliability goals without creating excess inventory.
- Work Planning is reactively driving parts quantities rather than managing inventory dollars. Work order parts needs are driven having every part and a whole component available rather than on proven use balances against predicted failure rates.

Why is reducing inventory important?

- We use cash to acquire inventory
- This cash is tied up in the inventory and is not available for other business improvements
- Inventory reduction leads to savings in cost of Capital by avoiding borrowing working capital
- This available capital would be channeled to plant improvements rather than being held static in inventory

Observations

- Static (sometimes referred to as "stranded") inventory can be up to 80% of the inventory value for a site

- Stranded does not mean Accounting Obsolete, those items are removed without question

Inventory Management Focus Topics for the Electric Utility Industry

- Availability – Having the right part at the right time at minimal cost
- Growth – Balancing the need for the part against the desires of our customers
- Storage – Do we have sufficient storage space to properly house the inventory?
- Accuracy – Having what you say you have
- Item Criticality - Making sure the items that are absolutely need are available
- Obsolescence - Making sure replacement items are identified and available
- Activity – Categorizing inventory based on usage patterns to avoid "Static" inventory
- Inventory Optimization – That magic number that will guarantee material availability at the least cost
- Processing times - Getting the material in AND out in a timely manner with little effort

All of the above must be balanced and monitored to ensure we have the right parts at the right time to avoid unnecessary inventory.

High impact contributors to inventory levels

- Duplicate items across fleets
  - Identify, combine and optimize at a fleet level. Transfer between sites rather than re-procure..

- Inventory items stored for Design Changes
  - Evaluate the Design Change status and remove items where the Design Change has been cancelled.

- Items that are candidates for inclusion in the PIM process
  - Investigate industry interest in sharing.

Utility Cooperation

- RAPID is the best mechanism for identifying needed parts within the industry
- SEER addition to RAPID enhances program to facilitate buying and selling of excess inventory within utilities
- CPM (Contingency Parts Manager) potential future addition to RAPID will allow identification and soft reservation of other utility parts in lieu of purchase
- Various 3rd parties are managing inter utility sales to reduce burden on utility staff and provide more practiced intermediaries

Inventory Optimization

Needed:

- Inventory stocking algorithm
  - Set min/max (reorder points) based on consistent formula across the fleet.
  - Provide Analysts with a tool/checklist to follow when setting min/max
- Complete identification of Significant and other Critical Spares
- Identify available inventory with the fleet and optimize based on a fleet concept
- Initiate practice of checking sister plants and sharing available fleet inventory
- Monitor over-max items for attrition
- Finalize Work Order Contingency Management Policy for materials

Inventory Optimization

Needed:

- Initiation of computerized/automated inventory optimization program
- Inventory Clean Up
    - Legacy computer system data conversion issues
    - Description enhancements (to help with identifying duplicate inventory)
    - Completion of inventory source code categorization to aid in volume procurement

Availability and Growth

- Inventory Growth is affected by many things such as:
  - New Item Adds
  - Average Unit Cost increases
  - Stock Material Returns (Especially where procurement to replace stock has occurred)
  - Inaccurate material usage predictions (poor optimization)
- Actions need to be identified to help close these gaps.
- Reviewing new item add usage and challenging the end user departments will help control inventory add growth
- Greater scrutiny of procurement cost increases can have a positive effect on inflationary increases
- Stronger challenges to Work Management on timely material returns will help curtail unnecessary procurement
- More conservative inventory optimization practices will have an impact on inventory value.

Inventory Level Impacts

- Storage and Accuracy
- Without a doubt excess inventory has an immediate and detrimental impact on available storage space. The costs involved in maintaining and staffing a warehouse are not always readily apparent. These hidden costs are impacted by:
- Warehouse structure maintenance
- Travel times need to retrieve material (Items are pushed further and further back as the inventory grows.
- Personnel requirements needed to manage the inventory
- Inventory Accuracy and shrinkage becomes an issue as the potential for "lost" material grows as the facility grows

Item Unavailability

- Item Criticality and Obsolescence are both issues that are difficult AND expensive to deal with.
  - The criticality of an item inventory goes well beyond the need for routine availability. These are items that are NOT routinely used and are generally very expensive and difficult to obtain in a timely manner.
  - The nature of the item requires that we maintain them in a "ready-ready" state.
- Likewise as manufacturing evolves, many items become unavailable.
  - These situations will force Inventory Managers to obtain as many of the items as possible to avoid impacting plant operations.
  - The process to replace these items generally require design changes to the plant or "re-engineering" both of which are expensive.

Inventory Activity, Optimization and the Effect on Processes

- Monitoring Inventory Activity helps Inventory Managers identify usage trends which will aid in setting the optimal inventory levels.

- Static inventory (inventory that has no usage in three or more years) should be reviewed need and properly addressed.
  - We should be asking ourselves; "Why are we reordering this item if it has not been used in the last three years?".
  - Closer alignment with Work Management can greatly aid the Supply Chain in this area by identifying items needed for Preventative Maintenance and setting stock levels so that just in time delivery occurs to support the PM work.
  - Actions such as this will reduce the impact to the Supply Chain staff and help improve overall process efficiency.

What do we need to do to improve in these areas?

Suggestions include:

- Inventory/Work Management Optimization Software
- Tools to improve inventory accuracy and process efficiency such as Mobile Maximo and RFID
- Partnering with our customers and peers at each site to take a more aggressive approach to availability
- Access to funding to allow removal of static inventory
- Benchmarking industry leaders. Identify Industry peers where growth has been contained.
- Standardization of all inventory items to the extent possible
- Central Warehousing of common items, optimizing as a fleet and leveraging volume procurement
- Vendor consignment of frequently used items.
- Application of Vending Machine technology coupled with RFID to track usage and handle transactions.
- Metrics – Monitoring your inventory from a site AND a fleet perspective and identifying gaps will allow us to better determine what, where and why inventory is managed a certain way.

Actions to Reduce

- Aggressively pursuing noted actions and actively monitoring our inventory will enable us to identify our gaps and stem inventory growth.

- Fleet Optimization will aid in volume procurement and will make storage and handling more efficient.

- Utilizing the latest optimization technology will help take the guess work out of setting inventory levels which will enhance procurement and storage.

- Utilizing efficiency technology such as RFID will make data entry, tracking and controlling inventory accuracy much more efficient.

Actions to Reduce

- Obtain the necessary tools and funding to properly analyze/categorize our inventory.
  - Having the proper tools and funding can greatly enhance the inventory control effort. Inventory reductions in the tens of millions of dollars can be realized.
- Evaluate our stocking strategy and move from the reactive min/max based process to a more predictive process where inventory is based on future need rather than past history.
- Move aggressively towards centralizing analytics and parts sharing rather than maintaining individual inventories at each site.
- Ensure inventory accountability is EVERYONE's responsibility rather that solely the responsibility of the Supply Chain.

Comments and Questions

- Any best practices to share with group?
- Good point to bring up any related topic for group feedback
- Welcome to leave a note or grab me later in conference
- Thank you

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