Integration of an EHS System to Facilitate Hazardous Material Management Efficiency

A case study of Hazardous Materials Inventory Level Management at a Naval Maintenance Shipyard

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Objective

Discuss how managing SUPPLY with DEMAND based planning can result in the reduction of procurement costs, waste disposal costs, man-hour costs and employee exposures.

Agenda

A Case Study from a naval Submarine Maintenance Site

- Co-existing Missions
- Hazardous Material Management at a military installation
- The Challenges
- The Tools
- Scenarios
- Replicable Solutions

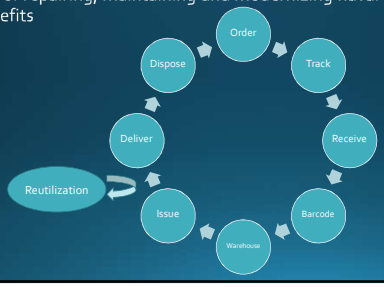
"The mission of the Navy is to maintain, train and equip combat-ready Naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas."

-US Navy

Intermediate Maintenance Facilities are responsible for maintaining and modernizing the fleet of submarines in support of that mission.

HazMat Central's Mission:

To provide hazardous material logistical support in order to meet the mission of repairing, maintaining and modernizing naval submarines during refits

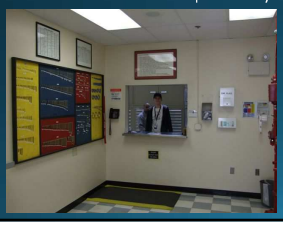


Costly HazMat Management

- Hazardous material was managed like toilet paper and envelopes!
- No inventory visibility
- Material expired, became damaged
- Resulted in costly disposal

Haz Mat Management at a military base

- CHRIMP
- Issue Points – A "pharmacy" approach



Challenges

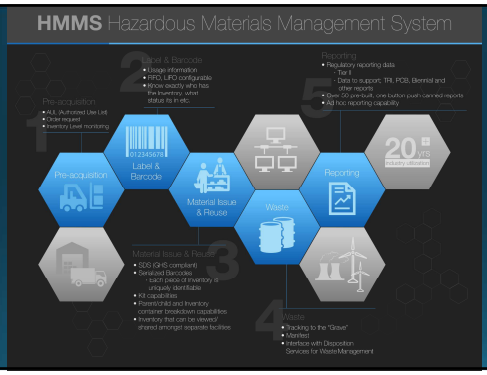
- Which products to stock and in what quantity
- Man-power: Huge cost driver!
- Stocking too little- impacts
- Stocking too much- impacts

The tools

- Subject Matter Experts!
- A hazardous material inventory control program
- If you have one and not the other, success is tough!

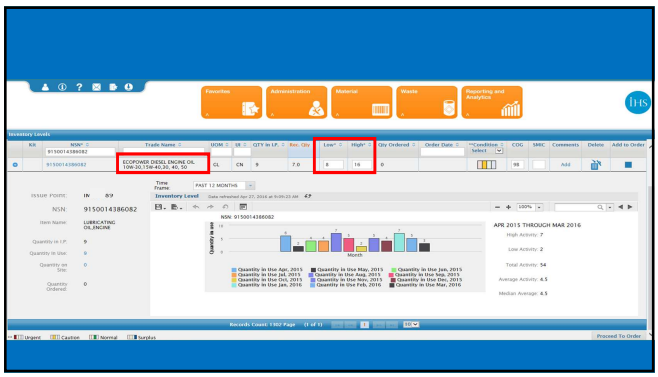
Subject Matter Experts

- Effectively managing these materials falls to the team at HazMat Central.
- Annually, this team manages:
- 1,100 types of haz mat… motor oil, solvents, adhesives, acids
- 90 maintenance shops
- Managing over three quarters of a million dollars of hazmat



Demand based planning Wrong vs. Right

- Forecast from your gut
- Educated guess
- Telepathic powers
- Purchase Delorean
- vs.
- Statistical Model set using available data



Setting the Highs and Lows

- Average monthly demand
- Average Lead time
- Endurance level
- Authorized Use List (AUL)
- Safety factor

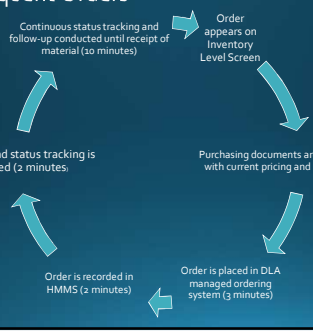
The Magic Formulas

- Low Limit (Re-order Point)
  - ((Average Monthly Demand + 1 safety factor)/30) * Average Lead Time + 1 safety factor)
- High Limit (Stocking Level)
  - ((Average Monthly Demand * Endurance Level) + (AMD/30)*Lead Time)) * (1-churn rate)

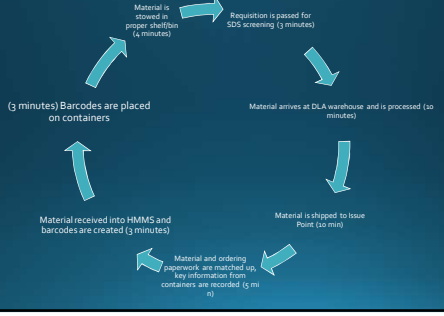
Scenario 1
Eco-Power diesel engine oil 15W40

- Receiving new stock > once/month
- It was discovered that in the past 12 months, the oil had been ordered 11 times!
- Storage allowed for 16 cans
- Analysis begins…

Impacts of Frequent Orders

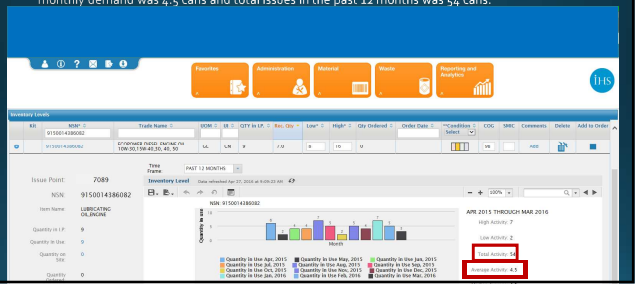


Impacts of Frequent Receiving



Information from the EHS tool

- The inventory manager first went to the inventory levels screen where she discovered that the average monthly demand was 4.5 cans and total issues in the past 12 months was 54 cans.



Getting deep…

- Churn rate was 0%
- Shelf Life Code is "0" (does not expire)
- This item is on 3 shop's AUL
- Average Lead time is 13.15 days
- Lead time standard deviation (safety factor) is 4.53 days
- Average monthly demand is 4.5 cans
- Average monthly demand standard deviation is 1.68 cans.

Impact of analyzed level setting

Prior to analysis with the puzzle pieces:
- High of 4 and a low of 2

After analysis:
- High of 29 and low of 4

Time saved:

9 hours per year (for just this product)

Scenario 2
Loctite Grade AVV Sealing Compound

- High set at 50 and Low set at 25
- It was discovered that the shelf life was being extended regularly.
- High usage, very popular. 22 shops
- Why wasn't it being used up before expiration?
- Analysis begins…

Shelf Life Extension

- What's in your cupboard?
- Once it expires, you throw it away.
- When hazmat expires, it becomes hazardous waste and disposal is expensive (sometimes 4x the purchase price!)
- When expiration date passes, it can be analyzed and if it's good, the expiration date can be extended!

Scenario 2 data

- Churn rate was 32.1% (there were 81 total issues and 55 unique serial #'s)
- Shelf Life Code is "6" (2 years)
- This item is on 22 shop's AUL
- Average Lead time is 14.56 days
- Lead time standard deviation is 6.33 days
- Average monthly demand is 6 bottles
- Average monthly demand standard deviation is 4.43 bottles

Impact of analyzed level setting

Prior to analysis with the puzzle pieces:
- High of 50 and a low of 25

After analysis:
- High of 26 and low of 7

Ordering way too much!

Scenario 3
Insulating Compound Kit

- High set at 10 and Low set at 6
- Purchase price: $406.80
- Disposal price $4.64/lb
- Past 3 years shows 21 kits were disposed
- $8,542.80 purchasing the kits
- $861.42 to dispose of them
- Total cost not including man-power is $9,404.22

Scenario 3 data

- Churn rate was 0%
- Shelf Life Code is "J" (1.5 years)
- This item is on 2 shop's AUL
- Average Lead time is 17.4 days
- Lead time standard deviation is 3.7 days
- Average monthly demand is 0.25 kits
- Average monthly demand standard deviation is 0.45 kits

Impact of analyzed level setting

Prior to analysis with the puzzle pieces:
- High of 10 and a low of 6

After analysis:
- High of 1 and low of 0

Waste costs significantly reduced!

Other factors

- Emergency Stock
- Surge Load
- Container breakdown
- Average Order Interval
- Shelf Life Code consideration
- Quantity per unit pack
- Minimum Order Quantity
- Price

Scenarios Summary

- Not managed properly has impacts
  - Increased man hours
  - Increased monetary costs
  - Stagnant inventory taking up valuable storage space
  - Additional EH&S considerations

Information held in the software
Needed experts to define the puzzle pieces

The Results

- Over the past year…
- Requisitions or orders have been reduced by 17%
- Decreased containers wasted by 19%
- Hundreds of man hours reduced
- All while maintaining a safe work environment

Your take away…

- Hazardous material management on an military base
- It takes more than just a software tool
- Keep the data points in mind
- If you don't have an EH&S system, keep these factors in mind in your search.

References

- Jennifer Moser, Hazardous Material Supply Analyst and Subject Matter Expert
- Demand Planning Wrong vs. Right. Kai Keppner
- CHRIMP Manual – NAVSUP Publication-722
- IHS Customer Case study

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