NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR

PRESENTATION ON SUMMER VOCATIONAL TRAINING AT RASHTRIYA ISPAT NIGAL LIMITED (RINL) VISAKHAPATNAM

PROJECT TITLE: OPTIMIZING INVENTORY MANAGEMENT IN FOUNDRY
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ENGINEERING SHOPS AND FOUNDRY (ES&F), RINL VIZAG

Engineering Shops & Foundry department is set up to meet the requirements of spares, repair of assemblies and reclamation of various jobs of different departments.

This complex consists of:
→Central Machine Shop (CMS)
→Steel Structural Shop (SSS)
→Foundry
→Forge Shop (FS)
→Utility Equipment Repair Shop (UERS)
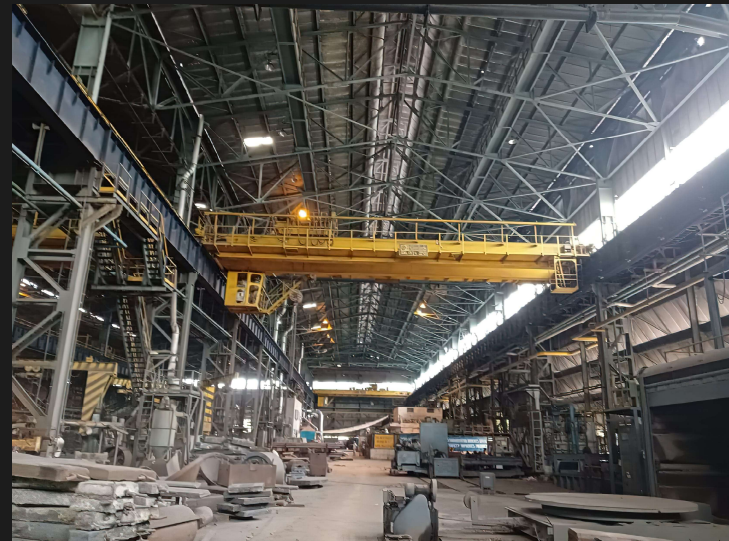
Main problems faced by the foundry inventory:

→Shortages

→Overstocking

→Delays

→Inaccurate pricing

OPTIMIZING INVENTORY
MANAGEMENT IN FOUNDRY:

3 Routes taken:
→ABC Analysis
→EOQ Calculation
→Reorder Point Calculation

ABC ANALYSIS

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Used to identify the items that have the most significant impact on costs or sales

Steps:
→Calculate the annual usage value for each item
(annual usage value = annual usage in units * price per unit)

→ After determining the annual usage value for each item, the items are ranked in descending order based on this value

→ Category A comprises the top 20% of items
→ Category B includes the subsequent 30% of items
→ Category C encompasses the remaining 50% of items

example:

Sl. No.:	Item Name	Units used annually	Price per unit	Annuage usage value	
1	Item 1	100	10	1000	→ A
2	Item 2	90	9	810	
3	Item 3	80	8	640	
4	Item 4	70	7	490	→ B
5	Item 5	60	6	360	
6	Item 6	50	5	250	
7	Item 7	40	4	160	
8	Item 8	30	3	90	→ C
9	Item 9	20	2	40	
10	Item 10	10	1	10	

EOQ CALCULATION

EOQ CALCULATION

EOQ: Economic Order Quantity

→ Widely used inventory management model that helps businesses determine the optimal order quantity for their inventory

→ Companies can minimize their inventory costs while ensuring that they have enough stock to meet customer demand

2 important factors:

Ordering costs: *These* include expenses associated with the process of placing and receiving inventory orders. This includes administrative tasks like preparing purchase orders, communication costs, such as contacting suppliers, and transportation costs for shipping the goods.

Holding costs: These refer to the expenses incurred for holding and storing inventory.

$$EOQ = \sqrt[2]{\frac{2 * D * S}{H}}$$

where   D: Annual demand

           S: Ordering cost

           H: Holding cost

Sl. No.:	Material	Units Of Quantity	Ordering Cost (In ₹)	Holding Cost (In ₹)	Annual Demand	EOQ
1	CO2 Gas	KG	21.23	0.005	37797.15	17916
2	Sodium Silicate	KG	19.98	0.0004	133414.73	115448
3	Graphite Rods	TO	350030	10400	6.66	21
4	High Silica Sand (Grade A)	TO	5478.22	17	1032.27	816
5	High Silica Sand (Grade B)	TO	4668.25	5	830.87	1246
6	Swing Frame Grinding Wheels	EA	24,678.62	1244	18	27

REORDER POINT CALCULATION

REORDER POINT CALCULATION

The reorder point is a concept used to determine when to place a new order for a particular item or product to ensure that there is sufficient stock on hand before it runs out.

To calculate reorder point, we need the following parameters:

→ **Average Demand per day:** This refers to the average quantity of a product that is consumed or sold per day.

→ **Lead Time in days:** Lead time is the duration between placing an order for a product and receiving it. It includes the time taken for processing the order, manufacturing or sourcing the product, and transportation or shipping.

→ **Safety Stock:** Safety stock is an additional inventory buffer that is held to account for uncertainties in demand and lead time. Safety stock serves as a contingency to avoid stockouts and maintain customer satisfaction

The formula for calculating reorder point is:

Reorder Point = (Average Demand per day × Lead Time in days) + Safety Stock

Sl. No.:	Material	Units	Average daily consumption	Average lead time (in days)	Safety stock	Reorder point
1	CO2 Gas	KG	103.5538572	421.5	0	43648
2	Sodium Silicate	KG	365.519827	340.25	0	124369
3	Graphite Rods	TO	0.018259553	332	0	7
4	High Silica Sand (Grade A)	TO	2.828141312	335	0	948
5	High Silica Sand (Grade B)	TO	2.27637491	338	0	770
6	Swing Frame Grinding Wheels	EA	0.049315068	253	0	13

THANKS

Do you have any questions?

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