

CASE ANALYSIS



WILKINS, A ZURN COMPANY: AGGREGATE
PRODUCTION PLANNING



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CASE SUMMARY

- Chris Connors- GM in Wilkins plant in Paso Robbles, California.
- Sales of plant increased by 20% in last one year.
- Zurn industries acquired Wilkins in 1971, Deal with full line of high quality water control product.
- In 1998, Zurn merged with US industries Bath and Plumbing Products Company and in 2003, entire company's name changed to Jacuzzi Brand
- Wilkins had positioned as a low cost producer with innovative product design and rapid response to market needs and trends.
- Head office require Connor to reduce inventory by 30% in next quarter.

CURRENT STRUCTURE

Plant

- The Wilkins plant was a 163,000 square foot facility located in 15 acres of land in Paso Robles, halfway between Los Angeles and SFO on highway 101 California.
- Plant consists of manufacturing operations, engineering lab, marketing, sales operations, office for 12 managers+ 33 non production employees.
- Outside sales force = 70 manufacturing sales rep., 52 licensed service centers.
- Mission: Develop great brands and great products so that they were the company of choice to drive customer's success.
- Manufactured 12 product lines and 25 product families.

Products

- Back flow prevention and water pressure reduction products (60% of company sales)
- Pressure reducing valves (25% of company sales)
- Pressure Vacuum Breakers (PVB) – Seasonal Sales and Make to Stock (MTS) items.
- Fire Valves – Seasonal Sales but demand is growing due to regulatory changes in new building construction. Make to Order (MTO) items.



CHALLENGES

- Head office asked to reduce inventory by 30% in next quarter.
- Determine whether APP will help Wilkins and what will be the risks?
- Level Production vs Chase Production vs Hybrid Production Approaches
- A possible adjustment in their workforce and a complete revamp of their forecasting methods.

AGGREGATE PRODUCTION PLANNING

APP is an operational activity that does an aggregate plan for the production process. It is done in advance of 6 to 18 months and it gives an idea to management about what quantity of materials and other resources are to be procured and when. It is done so that total cost of operations of the organization is kept to the minimum over that period.

Goals of APP

- To minimize the investments in the various inventories.
- To minimize the total cost over the planning horizon.
- To maximize the customer service.
- To minimize the changes in the workforce levels.
- To minimize the changes in the production rates.
- To maximize the utilization of the plant and the various equipment.

Benefits of APP

- Optimises the resources to meet the expected demand.
- Minimizes the cost and overproduction risk.
- Ensure sufficient customer service level.

Risks of APP

- The staffs might be resistant to change the normal system.
- High logistic costs.
- The outcome may not be as predicted due to bad data and bias.

SAFETY STOCK CALCULATIONS

- To calculate a safety stock for PVBs, take assumption for each quarter. Sigma Q1 = 1877, Sigma Q2 = 3361, Sigma Q3 = 3851, Sigma Q4 = 8154
- To calculate a safety stock for FVs, take assumption for each quarter. Sigma Q1 = 19, Sigma Q2 = 23, Sigma Q3 = 23, Sigma Q4 = 23

Safety Stock	PVB	FV
Q1	$2.33 \times 1877 \times \sqrt{2/13}$ = 1715	$2.33 \times 19 \times \sqrt{2/13} =$ 17
Q2	$2.33 \times 3361 \times \sqrt{2/13}$ = 3072	$2.33 \times 23 \times \sqrt{2/13} =$ 21
Q3	$2.33 \times 3851 \times \sqrt{2/13}$ = 3520	$2.33 \times 23 \times \sqrt{2/13} =$ 21
Q4	$2.33 \times 8154 \times \sqrt{2/13}$ = 7452	$2.33 \times 23 \times \sqrt{2/13} =$ 21

INPUTS

Input Parameter	PVB	FV
Regular Production Cost / Unit	25.65	136.7
Holding Cost per Quarter (20%)	1.283	6.835
Hiring Cost per employee	580	580
Firing Cost per Employee	300	300
Initial Inventory cost	1523789	181049
Initial Inventory Units	59407	1325
Maximum Labor Constraints	7	3
Maximum Unit Capacity	1365 per Day	80 Units per Day
Current Labor Assignment	6	3

- To reduce 30% inventory, we have to produce 30% of current inventory less from Total Production
- In Level PVB, Total Forecast of year = 350012 and now reduce 30% of 59407 i.e. 17823. So total production should be 332189
- In Chase PVB, Total production for first month will be reduced by 17823
- In Level PVB, Total Forecast of year = 2550 and now reduce 30% of 1325 i.e. 398. So total production should be
- In Chase PVB, Total production for first month will be reduced by 398

LEVEL STRATEGY FOR PVB

Wilkins Zurn Company					
Cost per PVB	\$25.65				
Employee Hiring Cost	\$580.00				
Employee Firing Cost	\$300.00				
Holding Cost	\$1.28				
Period	Q1	Q2	Q3	Q4	Totals
Forecast (Unit/Week)	4,120	7,480	9,341	5,983	26,924
Forecast (Unit/Quarter)	53,560	97,240	121,433	77,779	350,012
Safety Stock	1,715	3,072	3,520	7,452	
Production	83,047	83,047	83,047	83,047	332,188
Start Inventory	59,407	87,179	69,914	28,008	
End Inventory	87,179	69,914	28,008	25,824	
Average Inventory	73,293	78,547	48,961	26,916	
Cost of Production	\$2,130,155.55	\$2,130,155.55	\$2,130,155.55	\$2,130,155.55	
Cost of Hiring / Firing	\$0.00	\$0.00	\$0.00	\$0.00	
Inventory Holding Cost	\$94,034.92	\$100,775.16	\$62,816.96	\$34,533.23	
Quarterly Cost	\$2,224,190.47	\$2,230,930.71	\$2,192,972.51	\$2,164,688.78	
Total Cost					\$8,812,782.47

CHASE STRATEGY FOR PVB

Wilkins Zurn Company					
Cost per PVB	\$25.65				
Employee Hiring Cost	\$580.00				
Employee Firing Cost	\$300.00				
Holding Cost	\$1.28				
Period	Q1	Q2	Q3	Q4	Totals
Forecast (Unit/Week)	4,120	7,480	9,341	5,983	26,924
Forecast (Unit/Quarter)	53,560	97,240	121,433	77,779	350,012
Safety Stock	1,715	3,072	3,520	7,452	
Production	35,737	97,240	121,433	77,779	332,188
Start Inventory	59,407	39,869	36,797	33,277	
End Inventory	39,869	36,797	33,277	25,825	
Average Inventory	49,638	38,333	35,037	29,551	
Cost of Production	\$916,654.05	\$2,494,206.00	\$3,114,756.45	\$1,995,031.35	
Cost of Hiring / Firing	\$0.00	\$0.00	\$0.00	\$0.00	
Inventory Holding Cost	\$63,685.55	\$49,181.24	\$44,952.47	\$37,913.93	
Quarterly Cost	\$980,339.60	\$2,543,387.24	\$3,159,708.92	\$2,032,945.28	
Total Cost					\$8,716,381.05

LEVEL STRATEGY FOR FV

Wilkins Zurn Company					
Cost per PVB	\$136.70				
Employee Hiring Cost	\$580.00				
Employee Firing Cost	\$300.00				
Holding Cost	\$6.84				
Period	Q1	Q2	Q3	Q4	Totals
Forecast (Unit/Week)	43	51	51	51	196
Forecast (Unit/Quarter)	559	663	663	663	2,548
Safety Stock	17	21	21	21	
Production	538	538	538	538	2,152
Start Inventory	1,325	1,287	1,141	995	
End Inventory	1,287	1,141	995	849	
Average Inventory	1,306	1,214	1,068	922	
Cost of Production	\$73,544.60	\$73,544.60	\$73,544.60	\$73,544.60	
Cost of Hiring / Firing	\$0.00	\$0.00	\$0.00	\$0.00	
Inventory Holding Cost	\$8,926.51	\$8,297.69	\$7,299.78	\$6,301.87	
Quarterly Cost	\$82,471.11	\$81,842.29	\$80,844.38	\$79,846.47	
Total Cost					\$325,004.25

CHASE STRATEGY FOR FV

Wilkins Zurn Company					
Cost per PVB	\$136.70				
Employee Hiring Cost	\$580.00				
Employee Firing Cost	\$300.00				
Holding Cost	\$6.84				
Period	Q1	Q2	Q3	Q4	Totals
Forecast (Unit/Week)	43	51	51	51	196
Forecast (Unit/Quarter)	559	663	663	663	2,548
Safety Stock	17	21	21	21	
Production	161	663	663	663	2,152
Start Inventory	1,325	1,287	1,141	995	
End Inventory	910	1,266	1,120	974	
Average Inventory	1,118	1,277	1,131	985	
Cost of Production	\$22,008.70	\$90,632.10	\$90,632.10	\$90,632.10	
Cost of Hiring / Firing	\$0.00	\$0.00	\$0.00	\$0.00	
Inventory Holding Cost	\$7,638.11	\$8,724.88	\$7,726.97	\$6,729.06	
Quarterly Cost	\$29,646.81	\$99,356.98	\$98,359.07	\$97,361.16	
Total Cost					\$324,724.02

RECOMMENDATIONS

- As per the calculations, chase strategy is better as the cost is low as compared to level strategy.
- In this chase strategy is producing exactly what the customer is demanding. In high demand uncertainty, Chase strategy is always good.
- Invest more in planning and estimating forecasts, instead of using sales history alone.
- Develop an inventory tracking system and maintain good relation with the suppliers and distributors.
- Provide training to staffs on how the changes may benefit them.
- Ensure the forecast master is effectively used for production planning.
- Demand is getting fulfilled by existing full time employee. Wilkins can remove the temporary workers.
- Remove the bottleneck in FV production in order to maximize the efficiency.

THANK YOU

