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INTRODUCTION TO MATERIALS MANAGEMENT

CHAPTER 1

ANSWERS TO PROBLEMS

1.1

Sales		100%		100%
Cost of manufacturing	60%		50%	
Other costs	30%	90%	30%	80%
Profit (percent of Sales)		10%		20%

Therefore a 10% reduction in the cost of manufacturing would produce a 100% increase in profit.

1.2 Profit = Sales – (direct costs + overhead)

$0.20 = \text{Sales} - (0.60 \times \text{Sales} + 0.30)$

$\text{Sales} = \frac{0.5}{0.4} = 1.25 = 125\%$

To increase profits from 10% to 20% takes a 25% increase in sales but only a 10% decrease in costs. Good materials management can have a direct impact on profit. Note the cost of overhead has been left unchanged in this problem.

1.3

a. Weekly cost of goods sold $= \frac{\$15{,}000{,}000}{50} = \$300{,}000$

Value of 10 weeks' WIP $= 10 \times \$300{,}000 = \$3{,}000{,}000$

b. Value of 7 weeks' WIP $= 7 \times \$300{,}000 = \$2{,}100{,}000$

Reduction in WIP $= \$900{,}000$

Annual saving $= 20\% \times \$900{,}000 = \$180{,}000$

1.4

a. Weekly cost of goods sold $= \frac{\$40{,}000{,}000}{50} = \$800{,}000$

Value of 12 weeks' WIP $= 12 \times \$800{,}000 = \$9{,}600{,}000$

b. Value of 5 weeks' WIP $= 5 \times \$800{,}000 = \$4{,}000{,}000$

Reduction in WIP $= \$5{,}600{,}000$

Annual saving $= 20\% \times \$5{,}600{,}000 = \$1{,}120{,}000$

1.5 Using \$1 million as the units:

			As a % of sales	
Sales		\$10.0		100%
Direct material	\$3.5		35%	
Direct labor	2.5		25%	
Overhead	3.5	9.5	35%	95%
Profit		\$.5		5%

a. From the above we can say: (in millions or M\$)

Sales = direct material + direct labor + overhead + profit (now 1M\$)

= .35(sales) + .25(sales) + 3.5 M\$+ 1.0 M\$

.40 (Sales) = 4.5 M\$

Sales = 11.25 M\$ = 11.25 × \$1,000,000 = \$11,250,000

Therefore there must be a \$1.25 million increase in sales.

b. To increase profit by \$500,000 there must be a \$500,000 reduction in cost. Therefore direct material must be reduced by \$500,000. It therefore takes 2 ½ times the sales dollars to obtain the profit that would be realized in material reductions.

c. As for b. Direct labor would have to be reduced by \$500,000.