**PREMIER PRODUCTS, INC.**

Premier Products, Inc. manufactures tennis rackets. Premier Products has grown extensively over the past two years. While the company has been very profitable, President Mark Harrison is concerned with its ability to cost products accurately. Some products appear to be very profitable while others, which should be showing a profit, seem to be losing money. The production manager is convinced that his production processes are as efficient as any in the industry, and he is unable to explain the apparent high cost of producing some of the products.

Harrison agreed with his production manager and is convinced that the cost accounting system is at fault. He has hired Tom Arnold, a management consultant, to analyze the firm's costing system. Arnold has documented the existing costing system. It is a very simple system that uses a single allocation rate for all overhead costs. The overhead rate for the year is determined by adding together the budgeted variable and fixed overhead costs and dividing this sum by the number of budgeted labor hours. The standard cost of a product is found by multiplying the number of direct labor hours required to manufacture that product by the overhead rate and adding this quantity to the direct labor and material costs.

Arnold is convinced that the company's costing system is partially to blame for some of the firm's problems. He has assembled data for four of Premier's products. He has put together the actual costs required for each of these products in Table A. These costs will serve as the benchmark against which the results of different allocation schemes can be evaluated.

Of course, in real life we could never start out with accurate actual costs - accurate actual costs would be the end result that we would attempt to determine. But we provide this information as a learning aid to help you to clearly understand the key issues. Table A is as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PRODUCT** | **A** | **B** | **C** | **D** |
| Material | $15.00 | $ 5.00 | $10.00 | $ 5.00 |
| + Labor | 30.00 | 5.00 | 15.00 | 10.00 |
| +Variable OH | 15.00 | 7.50 | 5.00 | 7.50 |
| = Unit var. cost | $60.00 | $17.50 | $30.00 | $22.50 |
| Fixed overhead | $10,000 | $10,000 | $12,500 | $12,500 |
| Units produced | 1,000 | 1,000 | 1,000 | 1,000 |
| Unit fixed cost | $10.00 | $10.00 | $12.50 | $12.50 |
| **Total unit cost** | **$70.00** | **$27.50** | **$42.50** | **$35.00** |

The manufacturing processes for these products are structured such that the same labor and equipment can be used to produce products A and B but cannot be used to manufacture products C and D. Similarly, the labor and equipment used to manufacture products C and D cannot be used for A and B.

The company has the capacity to produce:

(1) 1,000 units of product A and 1,000 units of product B, or

(2) 2,000 units of product A, or

(3) 2,000 units of product B; or

(4) Any linear combination of products A and B.

The same is true for products C and D. The company has the capacity to produce:

(1) 1,000 units of product C and 1,000 units of product D, or

(2) 2,000 units of product C, or

(3) 2,000 units of product D; or

(4) Any linear combination of products C and D.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   Product |  Labor hrs per unit |  Variable Ohd/unit |  Number of units | Total labor hrs |  Total var ohd |
| A | 6 | $15.00 | 1,000 | 6,000 | $15,000 |
| B | 1 | 7.50 | 1,000 | 1,000 | 7,500 |
| C | 3 | 5.00 | 1,000 | 3,000 | 5,000 |
| D | 2 | 7.50 | 1,000 | 2,000 |  7,500 |
|  Total |   |   |  4,000 | 12,000 |  $35,000 |

The allocation rate is:

|  |  |
| --- | --- |
|  Variable overhead |  $35,000 |
|  Fixed overhead |  45,000 |
|  Total overhead costs |  $80,000 |
|  Labor hours |  12,000 |
|  Allocation rate per hour |  $6.67 |

Using this allocation rate, Arnold calculated the standard cost for the four products.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **PRODUCT** | **A** | **B** | **C** | **D** |
| Material | $15.00 | $ 5.00 | $10.00 | $ 5.00 |
| + Labor | 30.00 | 5.00 | 15.00 | 10.00 |
| +Allocated cost | 40.00 | 6.67 | 20.00 | 13.33 |
| **Total unit cost** | **$85.00** | **$16.67** | **$45.00** | **$28.33** |

The selling prices for the four products are:

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **B** | **C** | **D** |
| $98.00 | $38.50 | $59.50 | $49.00 |

Premier is considering a policy that would discontinue a product if its mark-on is under 25%. The mark-on is calculated by taking the selling price, subtracting the product's standard cost, and dividing by the standard cost. Harrison is concerned that if the firm's costing system does not provide accurate cost estimates, products will be dropped that should be retained. Arnold calculated that the mark-on for each product using the correct product costs in Table A is 40%.

**TABLE B**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   **PRODUCT** | **A** | **B** | **C** | **D** |
| **Selling price** | **$98.00** | **$38.50** | **$59.50** | **$49.00** |
| **Unit cost** | **$70.00** | **$27.50** | **$42.50** | **$35.00** |
|  Profit | $28.00 | $11.00 | $17.00 | $14.00 |
| Mark-on percentage | 40% (28/70) | 40% (11/27.50) | 40% (17/42.50) | 40% (14/35) |

Arnold then calculated the mark-on for the four products using the standard cost for each product based on allocating the overhead costs using direct labor hours.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **PRODUCT** | **A** | **B** | **C** | **D** |
| **Selling price** | **$98.00** | **$38.50** | **$59.50** | **$49.00** |
| **Unit cost** | **$85.00** | **$16.67** | **$45.00** | **$28.33** |
|  Profit | $13.00 | $21.83 | $14.50 | $20.67 |
| Mark-on percentage | 15% | 131%  | 32% | 73% |

Under the policy of dropping products with mark-ons under 25%, product A would be dropped. Arnold recalculates the allocation rate assuming product A is dropped and the manufacturing capacity is shifted to produce an additional 1,000 units of product B.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   Product |  Labor hrs per unit |  Variable Ohd/unit |  Number of units | Total labor hrs |  Total var ohd |
| B | 1 | 7.50 | 2,000 | 2,000 | $15,000 |
| C | 3 | 5.00 | 1,000 | 3,000 | 5,000 |
| D | 2 | 7.50 | 1,000 | 2,000 |  7,500 |
|  Total |   |   |  4,000 | 7,000 |  $27,500 |

The new allocation rate is:

|  |  |
| --- | --- |
|  Variable overhead |  $27,500 |
|  Fixed overhead |  45,000 |
|  Total overhead costs |  $72,500 |
|  Labor hours |  7,000 |
|  Allocation rate per hour |  $10.36 |

**QUESTIONS**

1. If Premier maintains its rule about dropping products with a mark-on below 25%, which additional products, if any, will it drop?

2. If you decide to drop additional product(s), recalculate the allocation rate for the new product mix. Keep repeating Question 1 until you reach a conclusion. What is that conclusion? Is there a pattern emerging in the order in which products are being dropped?

3. The firm allocates only variable product costs to each product based on direct labor hours. What is the contribution margin for each product? Which product or products should the company produce if it wants to maximize the contribution margin for all of the products it produces? What would be the impact on profits? How accurate is this method of allocating costs? If Premier stopped producing some products in its product line of tennis rackets, what might happen to the demand for the surviving products?

**NOTE:** A product's contribution margin is its selling price minus its variable cost per unit.

4. What would happen if the firm modified its costing system so that all variable costs were traced to the product accurately, but fixed costs were allocated using the existing system? Compute the cost for each product using this allocation process. What would be the impact on profits? How accurate is this method of allocating costs?

5. What would happen if the firm modified its costing system so that it contained two cost pools, one containing the overhead costs associated with Products A and B and the other overhead costs associated with Products C and D, and then allocated these overhead pools on the basis of direct labor hours? Compute the cost for each product using this allocation process. What would be the impact on profits? How accurate is this method of allocating costs?

6. Under what conditions would direct labor hours accurately allocate Premier's indirect costs to its four products? What are the characteristics of a cost accounting system that accurately allocates a company's fixed and variable indirect costs to its products?

7. Tom Arnold was hired to find accurate costs and a method of allocating that allows decisions to improve profitability.  Compare the profits and accuracy of all cost allocation schemes based on Tom Arnold's initial reason for being hired.

8. Do the company costing systems cause a problem?

9. What is the purpose of a cost allocation system?