EXERCISE 6-1 (10 minutes)


EXERCISE 6-2 (10 minutes)

1. Variable cost of inspection:
   The number of units inspected:
   \[ 5\% \times 10,000 \text{ units} = 500 \text{ units} \]
   Variable cost per unit \[ \times \$17 \] \[ \$8,500 \]
   Fixed cost of inspection \[ \$15,000 \]

2. Total quality inspection cost \[ \$23,500 \]
1. Process engineering cost rate:
   Total process engineering cost ......... $124,800
   Number of products .............................. \( \div 12 \)
   $10,400 per product

2. Estimated process engineering cost for 19x6:
   Cost rate per product ....................... $10,400
   Number of products 12 + 2 = ............ \( \times 14 \)
   $145,600

EXERCISE 6-8 (25 minutes)

1. New cost-activity relationships:

<table>
<thead>
<tr>
<th>(A)</th>
<th>(B)</th>
<th>(A ÷ B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>driver units</td>
<td>Cost</td>
</tr>
<tr>
<td>Unit-level $267,072 \times (1-0.3) = $186,950</td>
<td>2,568 claims</td>
<td>$72.80</td>
</tr>
<tr>
<td>Batch-level $267,072 \times 0.3 = $80,121</td>
<td>152 batches</td>
<td>527.12</td>
</tr>
<tr>
<td>Product-level $241,392 \times 0.4 = $96,556</td>
<td>8 types</td>
<td>12,069.60</td>
</tr>
<tr>
<td>Fixed    $241,392 \times (1-0.4) = $144,835</td>
<td></td>
<td>$144,835</td>
</tr>
<tr>
<td>Total    $508,464</td>
<td></td>
<td>$508,464</td>
</tr>
</tbody>
</table>

   The new cost function:
   Total department operating cost
   = $72.80 \times \text{number of claims}
   + $527.12 \times \text{number of batches}
   + $12,069.60 \times \text{types of policies}
   + \text{fixed cost}$144,835
EXERCISE 6-8 (Continued)

2. Estimated unit-level costs:
   Estimated number of claims  2,568 x 1.05 =  2,696
   Cost rate per claim .................. x $72.80
   Estimated unit-level costs .......... $196,269

Estimated batch-level costs:
   Average batch size = 2,568 ÷ 152 = 16.8947 claims
   [Note: This is an average size, and the number doesn't have to be a whole number.]

   Estimated number of batches:
   Estimated number of claims .......... 2,696
   Average batch size .................. ÷ 16.8947
   160 batches
   [Note: An estimate is an estimate. It does not reflect a certainty, and may not be a whole number.]

   Batch-level cost rate ............... $527.12
   Number of batches .................. x 160
   Estimated batch-level costs ....... $84,339

Estimated product-level costs:
   Number of new products (policy types) = 8 + 2 = 10
   Product-level cost rate ............ x $12,069.6
   Estimated product-level costs ...... $120,696

Estimated new operating costs of claims department:
   Unit-level ...................... $196,269
   Batch-level ..................... 84,339
   Product-level ................... 120,696
   Fixed cost ...................... 144,835
   $546,139
PROBLEM 6-18 (20 minutes)

1. 
   a. Cost rate for repair:
      Repair costs ($102,328 + $67,400) .. $169,728
      Number of operating hours ......... $68 per hour
   
   b. Cost rate for setup:
      Setup costs ($82,300 + $12,340) .... $94,640
      Number of production runs (4 x 14) .... $1,690 per run
   
   c. Cost rate for each process engineering activity:
      Process engineering costs .......... $168,280
      Number of ECN's (1.5 x 14) .......... $8,013.33 per ECN

2. Total cost:
   Fixed costs of the dept ................. $119,500
   Repair cost:
      $68 per hour x (2,496 x 1.1) ........... 186,701
   Setup cost:
      $1,690 x (4 x 12) .......................... 81,120
   Process engineering cost:
      $8,013.33 x (1.5 x 12) ................... 144,240
      $531,561
PROBLEM 6-19 (25 minutes)

1. Average batch size:
   Processing volume ...................... 14,600 units
   Number of batches (4 products x 5 runs) \( \div \) 20 batches
   \( \frac{730}{730} \) units

2. Total quality inspection cost:
   Unit-level: Units inspected x unit inspection cost
   \[ = 14,600 \times 5\% \times $15 = $10,950 \]
   Batch-level: Number of batches x batch inspection cost
   \[ = 20 \text{ batches} \times $450 = 9,000 \]
   Fixed cost:
   \[ \frac{18,000}{20} \]
   Total ............... $37,950

3. Setup cost per processing run:
   Setup personnel costs ........................ $220,000
   Other setup costs ............................... 71,000
   Setup cost total ................................ $291,000
   Setups for the period ............................. \( \div \) 20
   \[ \frac{14,550}{20} \]
   $14,550

4. Design support cost per product:
   Design support personnel costs $198,000
   Other design costs 48,000
   Design support cost total 246,000
   \( \div \) 4 products
   $61,500
   per product
PROBLEM 6-19 (Continued)

5. a. Estimated setup cost for the next period:

\[
\begin{align*}
\text{Number of setups,} \\
(4 + 1) \text{ products} \times 5 \text{ runs} &= 25 \text{ setups} \\
\text{Setup cost} \times $14,550 \text{ per setup} &= $363,750
\end{align*}
\]

b. Estimated design support cost for the next period:

\[
\begin{align*}
\text{Number of products} &= 5 \text{ products} \\
\text{Design support cost} \times $61,500 \text{ per product} &= $307,500
\end{align*}
\]