1. Flexible Budgets and Variance Analysis

<table>
<thead>
<tr>
<th>Units</th>
<th>Actual</th>
<th>Flexible Budget Variance</th>
<th>Flexible Budget</th>
<th>Sales Volume Variance</th>
<th>Master Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$53,200</td>
<td>$3,800U</td>
<td>$57,000 1</td>
<td>$3,000U</td>
<td>$60,000</td>
</tr>
<tr>
<td>Variable costs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$19,000</td>
<td>$3,800U</td>
<td>$15,200 2</td>
<td>$800F</td>
<td>$16,000</td>
</tr>
<tr>
<td>Selling &amp; Admin.</td>
<td>7,700</td>
<td>100U</td>
<td>7,600 3</td>
<td>400F</td>
<td>8,000</td>
</tr>
<tr>
<td>Total variable costs</td>
<td>$26,700</td>
<td>$3,900U</td>
<td>$22,800</td>
<td>1,200F</td>
<td>$24,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$26,500</td>
<td>$7,700U</td>
<td>$34,200</td>
<td>$1,800U</td>
<td>$36,000</td>
</tr>
<tr>
<td>Fixed costs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$16,000</td>
<td>$1,000U</td>
<td>$15,000</td>
<td></td>
<td>$15,000</td>
</tr>
<tr>
<td>Selling &amp; Admin.</td>
<td>10,000</td>
<td>1,000U</td>
<td>9,000</td>
<td></td>
<td>9,000</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$26,000</td>
<td>$2,000U</td>
<td>$24,000</td>
<td></td>
<td>$24,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 500</td>
<td>$9,700U</td>
<td>$10,200</td>
<td>$1,800U</td>
<td>$12,000</td>
</tr>
</tbody>
</table>

1. Budgeted selling price per unit x number of units sold
   = ($60,000/4,000) x 3,800 units
   = $15 per unit x 3,800 units = $57,000

2. Standard variable manufacturing cost per unit x number of units sold
   = ($16,000/4,000) x 3,800 units
   = $4 variable manufacturing cost per unit x 3,800 units = $15,200

3. Standard variable selling and administrative expense per unit x number of units
   = ($8,000/4,000) x 3,800 units
   = $2 per unit x 3,800 units = $7,600

Sales volume variances
In terms of contribution margin: $34,200 – $36,000 = $1,800U
In terms of operating income: $10,200 – $12,000 = $1,800U

Flexible-budget variances
Contribution margin: $26,500 – $34,200 = $7,700U
Operating income: $500 – $10,200 = $9,700U
2. The company reduced its selling price (from $15 per unit to $14 per unit) to compete in the market, suggesting the pursuit of a cost-leadership, not a differentiation, competitive strategy for the product. However, the company failed to exercise proper control of its operating costs, as indicated by unfavorable variances for manufacturing and for selling and administrative costs. The excess costs reduced the flexible-budget operating income of the period by 95 percent. Unless the company can get its costs under control, it will likely not be able to compete successfully as a cost leader or low-cost producer.

The company has unfavorable selling price and sales-volume variances. Even though the company reduced its selling price, it failed to attain the budgeted sales volume. The strategy of competing through reduced selling prices to gain sales has apparently failed.

3. An Excel spreadsheet solution file is embedded below. You can open this “object” by doing the following:

1. Right click anywhere in the worksheet area below.
2. Select “worksheet object” and then select “Open.”
3. To return to the Word document, select “File” and then “Close and return to...” while you are in the spreadsheet mode. The screen should then return you to this Word document.

<table>
<thead>
<tr>
<th>Item</th>
<th>Actual Results</th>
<th>Master Budget</th>
<th>Actual Per Unit</th>
<th>Budgeted Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>3,800</td>
<td>4,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales revenue</td>
<td>$53,200</td>
<td>$60,000</td>
<td>$14.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$19,000</td>
<td>$16,000</td>
<td>$5.00</td>
<td>$4.00</td>
</tr>
<tr>
<td>Variable selling &amp; administrative costs</td>
<td>$7,700</td>
<td>$8,000</td>
<td>$2.03</td>
<td>$2.00</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$16,000</td>
<td>$15,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14-38 Direct Materials and Direct Labor Variances

Note: Refer to Exhibit 14.4 for standard cost information.

1. *Purchase* price variance—Aluminum:

   Total lbs. aluminum purchased = lbs. used + ending inventory – beginning inventory = 3,375 + 25 – 50 = 3,350 pounds

   *Purchase* price variance = ($30 - $25)/lb. x 3,350 lbs. = $16,750U

   Usage (quantity) variance—Aluminum:

   Standard lbs. of aluminum allowed for the units manufactured:

   = 900 units x 4 pounds per unit = 3,600 pounds

   Usage variance: (3,375 – 3,600) lbs. x $25/lb. = $5,625F

The following diagram, similar to text Exhibit 14.11, may be useful for in-class presentation purposes.
2. Direct labor rate variance: \(\frac{($42 - $40)/hr. \times 4,200 \text{ hrs.}}{\text{}} = $8,400U\)

Direct labor efficiency variance:

Standard direct labor hours allowed for the units manufactured:
900 units x 5 hours/unit = 4,500 hours

Efficiency variance: \((4,200 - 4,500) \text{ hrs.} \times $40/hr. = $12,000F\)

The following diagram, similar to text Exhibit 14.7, may be useful for in-class presentation purposes:

\[
\begin{array}{ccc}
\text{(1)} & \text{(2)} & \text{(3)} \\
\text{Actual Input Cost} & \text{Actual Input at Standard Cost} & \text{Flexible-budget Amount} \\
(AQ) \times (AP) & (AQ) \times (SP) & (SQ) \times (SP) \\
(4,200 \text{ hrs.} \times $42/hr.) & (4,200 \text{ hrs.} \times $40/hr.) & (4,500 \text{ hrs.} \times $40/hr.) \\
\end{array}
\]

\[
\begin{align*}
\text{Price (Rate) Variance} &= (1) - (2) \\
&= $8,400U \\
\text{Quantity (Efficiency) Variance} &= (2) - (3) \\
&= $12,000F \\
\text{Total Flexible-Budget Variance} &= (1) - (3) \\
&= $176,400 - $180,000 = $3,600F
\end{align*}
\]
14-40 Materials Variances—Working Backwards (20-25 minutes)

**Actual Purchases**

<table>
<thead>
<tr>
<th>at Actual Cost (AQ) x (AP)</th>
<th>at Standard Cost (AQ) x (SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40,000 lbs. x AP</td>
<td>40,000 lbs. x $3.50/lb.</td>
</tr>
<tr>
<td>= $120,000</td>
<td>= $140,000</td>
</tr>
</tbody>
</table>

**Purchase Price Variance?**

- Actual Usage at Standard Cost (AQ) x (SP) = 38,000 lbs. x $3.50/lb. = $6,500 U
- Usage Variance

1. Purchase price per pound for direct materials:

   \[
   \frac{\$120,000}{40,000 \text{ lbs.}} = \$3.00 \text{ per lb.}
   \]

2. Total actual cost of direct materials purchased = $120,000

   Total direct materials purchased (pounds) = 40,000
   Standard cost per pound of direct materials x 3.50
   Total standard cost of direct materials purchased = 140,000
   Direct materials purchase-price variance = $20,000 F

3. Total direct materials used at standard cost = 38,000 x $3.50 = $133,000
   Less: unfavorable direct materials usage variance = – 6,500
   Standard DM cost for the units manufactured = $126,500
   Standard cost per lb. of direct material = + $3.50
   Total standard quantity of DM for the units manufactured = 36,143 lbs.