1. Appendix 10A: predetermined overhead rates and overhead analysis in a standard costing system (Slide #1 is the title slide)

*Learning Objective 4: Compute and interpret the fixed overhead budget and volume variances.*

2 1

#### Fixed manufacturing overhead variances

1. **Budget variance**
   * + 1. The equation for computing the budget variance is shown on this slide. It is simply the **difference** between the **actual fixed manufacturing overhead** and the **budgeted fixed manufacturing overhead** for the period.

3 2

1. **Volume variance**
2. The equation for computing the volume variance is shown on this slide. It is the difference between the budgeted fixed overhead and the fixed overhead applied to work in process.

4 3

1. The volume variance can also be computed as shown on this slide. The equation on the prior slide and this equation result in identical answers.

5 4

1. Both variance computations will be demonstrated in the forthcoming example.

#### ColaCo: computing fixed overhead variances

1. The background data needed for this example are shown in these two slides.

6-7 5-6

1. **Predetermined overhead rates**
   * + 1. The predetermined overhead rate (**$4.00**) is computed as shown on this slide.

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* + - 1. This rate can be broken down into a variable component (**$1.00**) and a fixed component (**$3.00**).

9 8

* + - * 1. The **fixed component** of the predetermined overhead rate will be used to compute the **volume variance**.
      1. The total overhead applied to work in process (**$336,000**) is computed as shown on this slide.
         1. Notice, the **standard hours allowed for the actual level** **of output** is used to apply overhead to work in process.
         2. In the job-order costing chapter, we used the **actual level of activity** to apply overhead costs to work in process.

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* + - * 1. The different approach arises because we are using a **standard cost system** in this chapter and the job-order costing chapter uses a **normal costing system**.

1. **Computing the budget variance**
   * + 1. The budget variance of **$10,000 U** is computed as shown. It is simply the difference between the actual fixed overhead (**$280,000**) and the budgeted fixed overhead (**$270,000**).

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* + - * 1. The variance is labeled as Unfavorable because the company actually incurred more cost than the budget projected.

1. **Computing the volume variance**
   * + 1. The volume variance of **$18,000 U** is computed as shown.
          1. The fixed overhead applied to work in process (**$252,000**) is computed by multiplying the fixed component of the predetermined overhead rate (**$3.00**) by the standard machine hours allowed for the actual output (**84,000 hours**).

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* + - 1. The volume variance of $18,000 U can also be computed using the equation shown on this slide.
         1. Because the standard hours allowed is **less than** the denominator volume, it presumably signals inefficient usage of facilities. Therefore, the variance is labeled as unfavorable.

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1. **A pictorial view of the variances**

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* + - 1. This slide offers a pictorial view of the computation of the fixed overhead volume and budget variances.

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#### ColaCo: a graphic analysis of the variances

1. The vertical axis is used to graph **fixed overhead cost**.

The first cost that ColaCo would plot on this axis is **$270,000** of budgeted fixed overhead.

1. The horizontal axis is used to graph **the volume of activity**.
2. The first activity level that ColaCo would plot is its denominator activity level of **90,000 machine hours**.

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1. The linear manner in which fixed overhead is **applied** to products is depicted by drawing a straight line from the origin to the intersection of the budgeted fixed overhead (**$270,000**) and the denominator activity (**90,000 machine hours**).
2. The slope of this line indicates that fixed overhead is applied at a rate of **$3 per machine hour**.
3. Next, plot the actual amount of fixed overhead costs on the vertical axis (**$280,000**).

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1. The difference between the budgeted amount of fixed overhead and the actual amount (**$10,000**) is the **budget variance**.
2. Finally, identify the **standard** **hours** allowed for the actual level of output (**84,000 hours**). Draw a vertical line from this activity level until it intersects the sloped line that depicts the fixed overhead applied to products. From this point, draw a horizontal line that intersects the vertical axis. This dollar amount (**$252,000**) represents the fixed overhead applied.

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1. The difference between the budgeted fixed overhead and the fixed overhead applied (**$18,000**) is the **volume variance**.

#### ColaCo: reconciling overhead variances and underapplied or overapplied overhead

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1. In a standard cost system, the sum of the overhead variances **equals** the underapplied or overapplied overhead cost for the period.
2. This slide shows how ColaCo’s underapplied or overapplied is computed.

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* + - 1. The manufacturing overhead is **$44,000 underapplied**.

1. Computing the variable overhead variances
   * + 1. ColaCo’s variable overhead rate variance (**$12,000 U**) is computed as shown on this slide.

21

* + - 1. ColaCo’s variable overhead efficiency variance (**$4,000 U**) is computed as shown on this slide.

22

1. Computing the sum of all variances.
   * + 1. The sum of the variable and fixed overhead variances (**$44,000 U**) is shown on this slide.

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* + - 1. Notice, the sum of the variances equals the amount of ColaCo’s underapplied overhead.