ESERCIZI

1 INVESTIGATION OF VARIANCES

Sommers Company uses the following rule to determine whether materials usage variances should be investigated: A materials usage variance will be investigated anytime the amount exceeds the lesser of $12,000 or 10 percent of the standard cost. Reports for the past five weeks provided the following information:

Week	*MUV* ($)	Standard Materials Cost ($)
1	10.500 F	120,000
2	10,700 U	100,500
3	9,00 F	120,000
4	13,500 U	127,500
5	10,500 U	103,500

Required:

1. Using the rule provided, identify the cases that will be investigated.
2. Suppose investigation reveals that the cause of an unfavorable materials usage variance is the use of lower-quality materials than are normally used. Who is responsible? What corrective action would likely be taken?
3. Suppose investigation reveals that the cause of a significant unfavorable materials usage variance is attributable to a new approach to manufacturing that takes less labor time but causes more material waste. Examination of the labor efficiency variance reveals that it is favorable and larger than the unfavorable materials usage variance. Who is responsible? What action should be taken?

2 MATERIALS VARIANCES

Legumbre Company produces vegetable juices, sold in gallons. Recently, the company adopted the following material standard for one gallon of its tomato juice:

Direct materials (128 oz: @ $0:06) = $7:68

During the first week of operation, the company experienced the following results:

a. Gallon units produced: 20,000.
b. Ounces of materials purchased and used: 2,600,000 ounces at $0.07.
c. No beginning or ending inventories of raw materials.

Required:

1. Compute the materials price variance.
2. Compute the materials usage variance.

3 MATERIALS AND LABOR VARIANCES

At the beginning of the year, Shults Company had the following standard cost sheet for one of its plastic products:

Direct materials (5 lbs. @ $4.00) $20.00

Direct labor (2 hrs. @ $11.25)	22.50
Standard prime cost per unit	$42.50

The actual results for the year are as follows:

a. Units produced: 175,000.
b. Materials purchased: 930,000 pounds @ $4.10.
c. Materials used: 925,000 pounds.
d. Direct labor: 362,500 hours @ $11.15.

Required:

1. Compute price and usage variances for materials.
2. Compute the labor rate and labor efficiency variances.

4 VARIANCES, EVALUATION, AND BEHAVIOR

Jackie Iverson was furious. She was about ready to fire Tom Rich, her purchasing agent. Just a month ago, she had given him a salary increase and a bonus for his performance. She had been especially pleased with his ability to meet or beat the price standards. But now, she found out that it was because of a huge purchase of raw materials. It would take months to use that inventory, and there was hardly space to store it. In the meantime, where could the other materials supplies be put that would be ordered and processed on a regular basis? Additionally, it was a lot of capital to tie up in inventory—money that could have been used to help finance the cash needs of the new product just coming on line.
Her interviewwith Tom was frustrating. He was defensive, arguing that he thought she wanted those standards met and that the means were not that important. He also pointed out that quantity purchases were the only way to meet the price standards. Otherwise, an unfavorable variance would have been realized.

Required:

1. Why did Tom Rich purchase the large quantity of raw materials? Do you think that this behavior was the objective of the price standard? If not, what is the objective(s)?
2. Suppose that Tom is right and that the only way to meet the price standards is through the use of quantity discounts. Also, assume that using quantity discounts is not a desirable practice for this company. What would you do to solve this dilemma?
3. Should Tom be fired? Explain.

5 MATERIALS AND LABOR VARIANCES

Camisa Company produces single-colored t-shirts. Materials for the shirts are dyed in large vats. After dying the materials for a given color, the vats must be cleaned and prepared for the next batch of materials to be colored. The following standards for changeover for a given batch have been established:

Direct materials (2.5 lbs. @ $0.90)	$2.25
Direct labor (0.75 hr. @ $7.00)	5.25
Standard prime cost	$7.50

During the year, 53,000 pounds of material were purchased and used for the changeover activity. There were 20,000 batches produced, with the following actual prime costs:

Direct materials	$42,000
Direct labor	102,000 (for 14,900 hrs.)

Required:
Compute the materials and labor variances associated with the changeover activity, labeling each variance as favorable or unfavorable.

6 JOURNAL ENTRIES

Refer to the data provided in Exercise 20-35.

Required:

1. Prepare a journal entry for the purchase of raw materials.
2. Prepare a journal entry for the issuance of raw materials.
3. Prepare a journal entry for the addition of labor to Work in Process.
4. Prepare a journal entry for the closing of variances to Cost of Goods Sold.

7 MATERIALS VARIANCES, JOURNAL ENTRIES

Esteban Products produces instructional aids. Among the company's products are white boards, which use colored markers instead of chalk. They are particularly popular for conference rooms in educational institutions and executive offices of large corporations. The standard cost of materials for this product is 12 pounds at $8.25 per pound.
During the first month of the year, 3,200 boards were produced. Information concerning actual costs and usage of materials follows:

Materials purchased	38,000 lbs @ $8.35
Materials used	**37,500 lbs**

Required:

1. Compute the materials price and usage variances.
2. Prepare journal entries for all activity relating to materials.

8 LABOR VARIANCES, JOURNAL ENTRIES

Escuchar Products, a producer of DVD players, has established a labor standard for its product—direct labor: 2 hrs at $9.65 per hour. During January, Escuchar produced 12,800 boards. The actual direct labor used was 25,040 hours at a total cost of $245,392.

Required:

1. Compute the labor rate and efficiency variances.

Prepare journal entries for all activities relating to labor.

9 SETTING STANDARDS AND ASSIGNING RESPONSIBILITY

Cabanarama Inc.designs and manufactures easy-to-set-up beach cabanas.The cabanas come in a kit that includes canvas, lacing, and aluminum support poles. Families can easily transport the cabanas to the beach, set them up, and have a protected place to change clothing, store picnic hampers, and soon. Cabanarama has expanded rapidly from a two-person opera-tion to one involving over a hundred employees. The founder and owner of Cabanarama, Frank Love, understands that a more formal approach to standard setting and control is needed to ensure that the consistent quality for which the company is known continues.

Frank and Annette Wilson, his financial vice president, divided the company into departments and designated each department as a cost center. Sales, Quality Control, and Design report directly to Frank. Production, Shipping, Finance, and Accounting report to Annette. In the production department, one of the supervisors was assigned the materials purchasing function; the job included purchasing all raw materials, overseeing inventory handling (receiving, storage, etc.), and tracking materials purchases and use.

Frank felt that control would be better achieved if there were a way for his employees to continue to perform in such a way that quality was maintained and cost reduction was achieved. Annette suggested that Cabanarama institute a standard costing system. Variances for materials and labor could then be calculated and reported directly to her, and she could alert Frank to any problems or opportunities for improvement.

Required:

1. a. When Annette designs the standard costing system for Cabanarama, who should be involved in setting the standards for each cost component?

b. What factors should be considered in establishing the standards for each cost component?
2. Assume that Cabanarama develops the standards for materials use, materials price, labor use, and labor wages. Who will be assigned responsibility for each and for any resulting variances? Why?

10 BASICS OF VARIANCE ANALYSIS, VARIABLE INPUTS

Guanamo Waste Disposal Company has a long-term contract with several large cities to collect garbage and trash from residential customers. To facilitate the collection, Gua-namo places a large plastic container with each household. Because of wear and tear, growth, and other factors, Guanamo places about 200,000 new containers each year (about 20 percent of the total households). Several years ago, Guanamo decided to manufacture its own containers as a cost-saving measure. A strategically located plant involved in this type of manufacturing was acquired. To help ensure cost efficiency, a standard cost system was installed in the plant. The following standards have been established for the product's variable inputs:

	Standard Quantity	Standard Price (rate in $)	Standar Cost ($)
Direct materials	12 lbs.	$ 3.00	$36.00
Direct labor	1.60 hrs.	10.00	16.00
Variable overhead	1.60 hrs.	2.50	4.00
Total			$56.00

During the first week, the company had the following actual results:

Units produced	4,000
Actual labor costs	$70,000
Actual labor hours	6,600
Materials purchased and used	46,000 lbs.@
Actual variable overhead	$26,500

The purchasing agent located a new source of slightly higher-quality plastic, and this material was used during the first week in January. Also, a new manufacturing process was implemented on a trial basis. The new process required a slightly higher level of skilled labor. The higher-quality material has no effect on labor utilization. However, the new manufacturing process was expected to reduce materials usage by 0.25 pound per can.

Required:

1. Compute the materials price and usage variances. Assume that the 0.25 pound per can reduction of materials occurred as expected and that the remaining effects are all attributable to the higher-quality material. Would you recommend that the purchasing agent continue to buy this quality, or should the usual quality be purchased? Assume that the quality of the end product is not affected significantly.
2. Compute the labor rate and efficiency variances. Assuming that the labor variances are attributable to the new manufacturing process, should it be continued or discontinued? In answering, consider the new process's materials reduction effect as well. Explain.

Refer to Requirement 2. Suppose that the industrial engineer argued that the new process should not be evaluated after only one week. His reasoning was that it would take at least a week for the workers to become efficient with the new approach. Suppose that the production is the same the second week and that the actual labor hours were 6,000 and the labor cost was $62,000. Should the new process be adopted? Assume the variances are attributable to the new process. Assuming production of 4,000 units per week, what would be the projected annual savings? (Include the materials reduction effect.)

11 SETTING STANDARDS, MATERIALS AND LABOR VARIANCES

Tom Belford and Tony Sorrentino own a small business devoted to kitchen and bath granite installations. Recently, building contractors have insisted on up-front bid prices for a house rather than the cost-plus system that Tom and Tony were used to. They worry because natural flaws in the granite make it impossible to tell in advance exactly how much granite will be used on a particular job. In addition, granite can be easily broken, meaning that Tom or Tony could ruin a slab and would need to start over with a new one. Sometimes the improperly cut pieces could be used for smaller installations, sometimes not. All their accounting is done by a local certified public accounting firm headed by Charlene Davenport. Charlene listened to their concerns and suggested that it might be time to implement tighter controls by setting up a standard costing system.

Charlene reviewed the invoices pertaining to a number of Tom and Tony's previous jobs to determine the average amount of granite and glue needed per square foot. She then updated prices on both materials to reflect current conditions. The standards she developed for one square foot of counter installed were as follows:

Granite, per square foot	$50.00
Glue (10 oz. @ $0.15)	1.50
Direct labor hours:	
Cutting labor (0.10 hr. @ $15)	1.50
Installation labor (0.25 hr. @ $25)	6.25

These standards assumed that one seamless counter requires one sink cut (the space into which the sink will fit) as well as cutting the counter to fit the space available. Charlene tracked the actual costs incurred by Tom and Tony for granite installation for the next six months. She found that they completed 50 jobs with an average of 32 square feet of granite installed in each one. The following information on actual amounts used and cost was gathered:

Granite purchased and used (1,640 sq. ft.)	$79,048
Glue purchased and used (16,000 oz.)	$2,560
Actual hours cutting labor	180
Actual hours installation labor	390

The actual wage rate for cutting and installation labor remained unchanged from the standard rate.

Required:

1. Calculate the materials price variances and materials usage variances for granite and for glue for the past six months.
2. Calculate the labor rate variances and labor efficiency variances for cutting labor and for installation labor for the past six months.

Would it be worthwhile for Charlene to establish standards for atypical jobs (e.g., those with more than one sink cut or wider than normal)?

12 SETTING A DIRECT LABOR STANDARD, LEARNING CURVE EFFECTS, SERVICE COMPANY

Mantenga Company provides routine maintenance services for heavy moving and transportation vehicles. Although the vehicles vary, the maintenance services provided follow a fairly standard pattern. Recently, a potential customer has approached the company, requesting a new maintenance service for a radically different type of vehicle. New servicing equipment and some new labor skills will be needed to provide the

maintenance service. The customer is placing an initial order to service 150 vehicles and has indicated that if the service is satisfactory, several additional orders of the same size will be placed every three months over the next three to five years.
Mantenga uses a standard costing system and wants to develop a set of standards for the new part. The usage standards for direct materials such as oil, lubricants, and transmission fluids were easily established. The usage standard is 25 quarts per servicing, with a standard cost of $4 per quart. Management has also decided on standard rates for labor and overhead: The standard labor rate is $15 per direct labor hour, the standard variable overhead rate is $8 per direct labor hour, and the standard fixed overhead rate is $12 per hour. The only remaining decision is the standard for labor usage. To assist in developing this standard, the engineering department has estimated the following relationship between units serviced and average direct labor hours used:

Units Serviced	Cumulative Average Time per Unit (hours)
40	2.500
80	2.000
160	1.600
320	1.280
640	1.024

Required:

1. Assume that the average labor time is 0.768 hour per unit after the learning effects are achieved. Using this information, prepare a standard cost sheet that details the standard service cost per unit. Round costs to two decimal places.
2. Given the per-unit labor standard set, would you expect a favorable or an unfavorable labor efficiency? Explain. Calculate the labor efficiency variance for servicing the first 320 units.
3. Assuming no further improvement in labor time per unit is possible past 320 units, explain why the cumulative average time per unit at 640 is lower than the time at 320 units. Show that the standard labor time should be 0.768 hour per unit. Explain why this value is a good choice for the per-unit labor standard.

13 UNIT COSTS, MULTIPLE PRODUCTS, VARIANCE ANALYSIS, SERVICE SETTING

The maternity wing of the city hospital has two types of patients: normal and cesarean. The standard quantities of labor and materials per delivery for 2009 are:

	Normal	Cesarean
Direct materials (lbs.)	8	20
Nursing labor (hrs.)	2	4

The standard price paid per pound of direct materials is $10. The standard rate for labor is $16. Overhead is applied on the basis of direct labor hours. The variable overhead rate for maternity is $30 per hour, and the fixed overhead rate is $40 per hour.
Actual operating data for 2009 are as follows:

a. Patient days produced: normal, 3,500; cesarean, 7,000.
b. Direct materials purchased and used: 172,000 pounds at $9.50—30,000 for normal maternity patients and 142,000 for the cesarean patients; no beginning or ending raw materials inventories.
c. Nursing labor: 36,500 hours—7,200 hours for normal patients and 29,300 hours for the cesarean; total cost of labor, $580,350.

Required:

1. Prepare a standard cost sheet showing the unit cost per patient day for each type of patient.
2. Compute the materials price and usage variances for each type of patient.

3. Compute the labor rate and efficiency variances.
4. Assume that you know only the total direct materials used for both products and the total direct labor hours used for both products. Can you compute the total materials usage and labor efficiency variances? Explain.
5. Standard costing concepts have been applied in the healthcare industry. For example, diagnostic-related groups (DRGs) are used for prospective payments for Medicare patients. Select a search engine (such as Yahoo! or Google), and conduct a search to see what information you can obtain about DRGs. You might try ‘‘Medicare DRGs’’ as a possible search topic. Write a memo that answers the following questions:
   a. What is a DRG?
   b. How are DRGs established?
   c. How many DRGs are used?
   d. How does the DRG concept relate to standard costing concepts discussed in the chapter? Can hospitals use DRGs to control their costs? Explain.

14 CONTROL LIMITS, VARIANCE INVESTIGATION

Goodsmell Company produces a well-known cologne. The standard manufacturing cost of the cologne is described by the following standard cost sheet:

Direct materials:
Liquids (4.2 oz. @ $0.25) $1.05
Bottles (1 @ $0.05) 0.05
Direct labor (0.2 hr. @ $12.50) 2.50
Variable overhead (0.2 hr. @ $4.70) 0.94
Fixed overhead (0.2 hr. @ $1.00) 0.20
Standard cost per unit $4.74

Management has decided to investigate only those variances that exceed the lesser of 10 percent of the standard cost for each category or $20,000.

During the past quarter, 250,000 four-ounce bottles of cologne were produced. Descriptions of actual activity for the quarter follow:

a. A total of 1.15 million ounces of liquids was purchased, mixed, and processed. Evaporation was higher than expected (no inventories of liquids are maintained). The price paid per ounce averaged $0.27.
b. Exactly 250,000 bottles were used. The price paid for each bottle was $0.048.

Normal production volume for Goodsmell is 250,000 bottles per quarter. The standard overhead rates are computed by using normal volume. All overhead costs are incurred uniformly throughout the year.

Required:

1. Calculate the upper and lower control limits for each manufacturing cost category.
2. Compute the total materials variance, and break it into price and usage variances. Would these variances be investigated?
3. Compute the total labor variance, and break it into rate and efficiency variances. Would these variances be investigated?

15 CONTROL LIMITS, VARIANCE INVESTIGATION

The management of Golding Company has determined that the cost to investigate a variance produced by its standard cost system ranges from $2,000 to $3,000. If a problem is discovered, the average benefit from taking corrective action usually outweighs the cost of investigation. Past experience from the investigation of variances has revealed that corrective action is rarely needed for deviations within 8 percent of the standard cost. Golding produces a single product, which has the following standards for materials and labor:

Direct materials (8 lbs. @ $0.25) $2
Direct labor (0.4 hr. @ $7.50) 3

Actual production for the past three months with the associated actual usage and costs for materials and labor follow. There were no beginning or ending raw materials inventories.

	April	May	June
Production (units)	90,000	100,000	110,000
Direct materials:			
Cost	$189,000	$218,000	$230,000
Usage (lbs.)	723,000	870,000	885,000
Direct labor:			
Cost	$270,000	$323,000	$360,000
Usage (hrs.)	36,000	44,000	46,000

Required:

1. What upper and lower control limits would you use for materials variances? For labor variances?
2. Compute the materials and labor variances for April, May, and June. Identify those that would require investigation.
3. Let the horizontal axis be time and the vertical axis be variances measured as a percentage deviation from standard. Draw horizontal lines that identify upper and lower control limits. Plot the labor and material variances for April, May, and June. Prepare a separate graph for each type of variance. Explain how you would use these graphs (called *control charts)* to assist your analysis of variances.

16 STANDARD COSTING, PLANNED VARIANCES

Ogundipe Company manufactures a plastic toy cell phone. The following standards have been established for the toy's materials and labor inputs:

	Standard Quantity ($)	Standard Price Standard (Rate in $)	Cost
Direct materials	0.5 lb.	1	0.50
Direct labor	0.1 hr.	10	
	1.00		

During the first week of July, the company had the following results:

Units produced	40,000
Actual labor costs	$42,000
Actual labor hours	4,100
Materials purchased and used	19,500 lbs. @ $1.05 per lb

Other information: The purchasing agent located a new source of slightly higher-quality plastic, and this material was used during the first week in July. Also, a new manufacturing layout was implemented on a trial basis. The new layout required a slightly higher level of skilled labor. The higher-quality material has no effect on labor utilization. Similarly, the new manufacturing approach has no effect on material usage.

Required:

1. Compute the materials price and usage variances. Assuming that the materials variances are essentially attributable to the higher quality of materials, would you recommend that the purchasing agent continue to buy this quality, or should the usual quality be purchased? Assume that the quality of the end product is not affected significantly.
2. Compute the labor rate and efficiency variances. Assuming that the labor variances are attributable to the new manufacturing layout, should it be continued or discontinued? Explain.
3. Refer to Requirement 2. Suppose that the industrial engineer argued that the new layout should not be evaluated after only one week. His reasoning was that it would take at least a week for the workers to become efficient with the new approach. Suppose that the production is the same the second week and that the actual labor hours were 3,900 and the labor cost was $39,000. Should the new layout be adopted? Assume the variances are attributable to the new layout. If so, what would be the projected annual savings?

17 STANDARD COSTING

Whitecotton Company produces plastic bottles. The unit for costing purposes is a case of 18 bottles. The following standards for producing one case of bottles have been established:

Direct materials (5 lbs @ $0.80)	$ 4
Direct labor (1.5 hours @ $16.00)	24
Standard prime cost	$28

During December, 52,000 pounds of material were purchased and used in production. There were 10,000 cases produced, with the following actual prime costs:

Direct materials $40,000

Direct labor 236,910 (for 14,900 hrs.)

Required:

1. Compute the materials variances.
2. Compute the labor variances.

What are the advantages and disadvantages that can result from the use of a standard costing system?

18 VARIANCE ANALYSIS, REVISION OF STANDARDS, JOURNAL ENTRIES

The Lubbock plant of Morril's Small Motor Division produces a major subassembly for a 6.0 horsepower motor for lawn mowers. The plant uses a standard costing system for production costing and control. The standard cost sheet for the subassembly follows:
Direct materials (6.0 lbs. @ $5.00) $30.00
Direct labor (1.6 hrs. @ $12.00) 19.20

During the year, the Lubbock plant had the following actual production activity:

a. Production of motors totaled 50,000 units.
b. A total of 260,000 pounds of raw materials was purchased at $4.70 per pound.
c. There were 60,000 pounds of raw materials in beginning inventory (carried at $5 per lb.). There was no ending inventory.
d. The company used 82,000 direct labor hours at a total cost of $1,066,000.

The Lubbock plant's practical activity is 60,000 units per year. Standard overhead rates are computed based on practical activity measured in standard direct labor hours.

Required:

1. Complete the materials price and usage variances. Of the two materials variances, which is viewed as the most controllable? To whom would you assign responsibility for the usage variance in this case? Explain.
2. Compute the labor rate and efficiency variances. Who is usually responsible for the labor efficiency variance? What are some possible causes for this variance?
3. Assume that the purchasing agent for the small motors plant purchased a lower-quality raw material from a new supplier. Would you recommend that the plant continue to use this cheaper raw material? If so, what standards would likely need revision to reflect this decision? Assume that the end product's quality is not significantly affected.
4. Prepare all possible journal entries

19 ESTABLISHMENT OF STANDARDS, VARIANCE ANALYSIS

Paul Golding and his wife, Nancy, established Crunchy Chips in 1938. (Nancy sold her piano to help raise capital to start the business.) Paul assumed responsibility for buying potatoes and selling chips to local grocers; Nancy assumed responsibility for production. Since Nancy was already known for her delicious thin potato chips, the business prospered. Over the past 60 years, the company has established distribution channels in 11 western states, with production facilities in Utah, New Mexico, and Colorado. In 1980, Paul Golding died, and his son, Edward, took control of the business. By 2009, the company was facing stiff competition from national snack-food companies. Edward was advised that the company's plants needed to gain better control over production costs. To assist in achieving this objective, he hired a consultant to install a standard costing system. To help the consultant in establishing the necessary standards, Edward sent her the following memo:

To: Diana Craig, Certified Management Accountant
From: Edward Golding, President, Crunchy Chips
Subject: Description and Data Relating to the Production of Our Plain Potato Chips
Date: September 28, 2009

The manufacturing process for potato chips begins when the potatoes are placed into a large vat in which they are automatically washed. After washing, the potatoes flow directly to an automatic peeler. The peeled potatoes then pass by inspectors, who manually cut out deep eyes or other blemishes. After inspection, the potatoes are automatically sliced and are dropped into the cooking oil. The frying process is closely monitored by an employee. After the chips are cooked, they pass under a salting device and then pass by more inspectors, who sort out the unacceptable finished chips (those that are discolored or too small). The chips then continue on the conveyor belt to a bagging machine that bags them in one-pound bags. After bagging, the bags are placed in a box and shipped. The box holds 15 bags.

The raw potato pieces (eyes and blemishes), peelings, and rejected finished chips are sold to animal feed producers for $0.16 per pound. The company uses this revenue to reduce the cost of potatoes; we would like this reflected in the price standard relating to potatoes.

Crunchy Chips purchases high-quality potatoes at a cost of $0.245 per pound. Each potato averages 4.25 ounces. Under efficient operating conditions, it takes four potatoes to produce one 16-ounce bag of plain chips. Although we label bags as containing 16 ounces, we actually place 16.3 ounces in each bag. We plan to continue this policy to ensure customer satisfaction. In addition to potatoes, other raw materials are the cooking oil, salt, bags, and boxes. Cooking oil costs $0.04 per ounce, and we use 3.3 ounces of oil per bag of chips. The cost of salt is so small that we add it to overhead. Bags cost $0.11 each and boxes $0.52 each.
Our plant produces 8.8 million bags of chips per year. A recent engineering study revealed that we would need the following direct labor hours to produce this quantity if our plant operates at peak efficiency:

Raw potato inspection	3,200
Finished chip inspection	12,000
Frying monitor	6,300
Boxing	16,600
Machine operators	6,300

I'm not sure that we can achieve the level of efficiency advocated by the study. In my opinion, the plant is operating efficiently for the level of output indicated if the hours allowed are about 10 percent higher.
The hourly labor rates agreed upon with the union are:

Raw potato inspectors	$15.20
Finished chip inspectors	10.30
Frying monitor	14.00
Boxing	11.00
Machine operators	13.00

Overhead is applied on the basis of direct labor dollars. We have found that variable overhead averages about 116 percent of our direct labor cost. Our fixed overhead is budgeted at $1,135,216 for the coming year.

Required:

1. Discuss the benefits of a standard costing system for Crunchy Chips.
2. Discuss the president's concern about using the result of the engineering study to set the labor standards. What standard would you recommend?
3. Form a group with two or three other students. Develop a standard cost sheet for Crunchy Chips' plain potato chips.
4. Suppose that the level of production was 8.8 million bags of potato chips for the year as planned. If 9.5 million pounds of potatoes were used, compute the materials usage variance for potatoes.

20 STANDARD COSTING, ETHICAL BEHAVIOR, USEFULNESS OF STANDARD COSTING

Pat James, the purchasing agent for a local plant of the Oakden Electronics Division, was considering the possible purchase of a component from a new supplier. The component's purchase price, $0.90, compared favorably with the standard price of $1.10. Given the quantity that would be purchased, Pat knew that the favorable price variance would help to offset an unfavorable variance for another

component. By offsetting the unfavorable variance, his overall performance report would be impressive and good enough to help him qualify for the annual bonus. More importantly, a good performance rating this year would help him to secure a position at division headquarters at a significant salary increase.

Purchase of the part, however, presented Pat with a dilemma. Consistent with his past behavior, Pat made inquiries regarding the reliability of the new supplier and the part's quality. Reports were basically negative. The supplier had a reputation for making the first two or three deliveries on schedule but being unreliable from then on. Worse, the part itself was of questionable quality. The number of defective units was only slightly higher than that for other suppliers, but the life of the component was 25 percent less than what normal sources provided.

If the part were purchased, no problems with deliveries would surface for several months. The problem of shorter life would cause eventual customer dissatisfaction and perhaps some loss of sales, but the part would last at least 18 months after the final product began to be used. If all went well, Pat expected to be at headquarters within six months. He saw little personal risk associated with a decision to purchase the part from the new supplier. By the time any problems surfaced, they would belong to his successor. With this rationalization, Pat decided to purchase the component from the new supplier.

Required:

1. Do you agree with Pat's decision? Why or why not? How important was Pat's assessment of his personal risk in the decision? Should it be a factor?
2. Do you think that the use of standards and the practice of holding individuals accountable for their achievement played major roles in Pat's decision?
3. Review the discussion on corporate ethical standards in Chapter 13 and read the Institute of Management Accountants ''Statement of Ethical Professional Practice'' found at https://www.imanet.org/about_ethics_statement.asp. Identify the standards that might apply to Pat's situation. Should every company adopt a set of ethical standards that apply to its employees, regardless of their specialty?
4. The usefulness of standard costing has been challenged in recent years. Some claim that its use is an impediment to the objective of continuous improvement (an objective that many feel is vital in today's competitive environment). Write a short paper (individually or in a small group with two or three other students) that analyzes the role and value of standard costing in today's manufacturing environment. Address the following questions:

    a. What are the major criticisms of standard costing?
    b. Will standard costing disappear, or is there still a role for it in the new manufac
    turing environment? If so, what is the role?
    c. Given the criticisms, can you explain why its use continues to be so prevalent?
    Will this use eventually change?

In preparing your paper, the following references may be useful; however, do not restrict your literature search to these references. They are simply to help you get started.

SOLUZIONI

Esercizio 1

1. Cases needing investigation:

   Week 2: Exceeds the 10% rule.

   Week 4: Exceeds the $12,000 rule and the 10% rule.

   Week 5: Exceeds the 10% rule.

2. The purchasing agent is responsible. Corrective action would require a return to the purchase of the higher-quality material normally used.

3. Production engineering is responsible. If the relationship is expected to persist, then the new labor method should be adopted and standards for materials and labor need to be revised.

Esercizio 2

1. MPV = (AP – SP)AQ
   = ($0.07 – $0.06)2,600,000 = $26,000 *U*

2. MUV = (AQ – SQ*)SP
   = (2,600,000 – 2,560,000)$0.06 = $2,400 *U*

   *SQ = 128 × 20,000 = 2,560,000

Esercizio 3

1. MPV = (AP – SP)AQ
   = ($4.10 – $4.00)930,000
   = $93,000 *U*

   MUV = (AQ – SQ)SP
   = (925,000 – 875,000)$4.00
   = $200,000 *U*

   Note: There is no 3-pronged analysis for materials because materials purchased is different from the materials issued. (Materials purchased is used for MPV and materials issued for MUV.)

2. LRV = (AR – SR)AH
   = ($11.15 – $11.25)362,500
   = $36,250 *F*

   LEV = (AH – SH)SR
   = (362,500 – 350,000)$11.25
   = $140,625 *U*

   AR × AH SR × AH SR × SH

$11.15 × 362,500	$11.25 × 362,500	$11.25 × 350,000
$4,041,875	$4,078,125	$3,937,500
$36,250 *F*	$140,625 *U*	
Rate	Efficiency	

Esercizio 4

1. Tom purchased the large quantity to obtain a lower price so that the price standard could be met. In all likelihood, given the reaction of Jackie Iverson, encouraging the use of quantity discounts was not an objective of setting price standards. Usually, material price standards are to encourage the purchasing agent to search for sources that will supply the quantity and quality of material desired at the lowest price.

2. It sounds like the price standard may be out of date. Revising the price standard and implementing a policy concerning quantity purchases would likely prevent this behavior from reoccurring.

3. Tom apparently acted in his own self-interest when making the purchase. He surely must have known that the quantity approach was not the objective. Yet the reward structure suggests that there is considerable emphasis placed on meeting standards. His behavior, in part, was induced by the reward system of the company. Probably he should be retained with some additional training concerning the goals of the company and a change in emphasis and policy to help encourage the desired behavior.

Esercizio 5

Materials:

AP × AQ	SP × AQ	SP × SQ
	$0.90 × 53,000	$0.90 × 50,000
$42,000	$47,700	$45,000
$5,700 *F*	$2,700 *U*	
Price	Usage	

Labor:

AR × AH	SR × AH	SR × SH
	$7.00 × 14,900	$7.00 × 15,000
$102,000	$104,300	$105,000
$2,300 *F*	$700 *F*	
Rate	Efficiency	

Esercizio 6

1.	Materials	47,700	
	MPV		5,700
	Accounts Payable		42,000
2.	Work in Process	45,000	
	MUV	2,700	
	Materials		47,700
3.	Work in Process	105,000	
	LRV		2,300
	LEV		700
	Accrued Payroll		102,000
4.	MPV	5,700	
	LRV	2,300	
	LEV	700	
	MUV		2,700
	Cost of Goods Sold		6,000

Esercizio 7

1. MPV = (AP – SP)AQ
   = ($8.35 – $8.25)38,000 = $3,800 *U*

   MUV = (AQ – SQ)SP
   = (37,500 – 38,400)$8.25 = $7,425 *F*

   (The 3-pronged variance diagram is not shown because MPV is for materials purchased and not materials issued, and the two differ.)

2.	Materials	313,500	
	MPV	3,800	
	Accounts Payable		317,300
	Work in Process	316,800	
	MUV		7,425
	Materials		309,375

Esercizio 8

1. LRV = (AR – SR)AH
   = ($9.80 – $9.65)25,040 = $3,756 *U*

   Note: AR = $\frac{\$245,392}{25,040}$

   LEV = (AH – SH)SR
   = (25,040 – 25,600)$9.65 = $5,404 *F*

AR × AH	SR × AH	SR × SH
$9.80 × 25,040	$9.65 × 25,040	$9.65 × 25,600
$245,392	$241,636	$247,040
$3,756 *U*	$5,404 *F*	
Rate	Efficiency	

2.	Work in Process	247,040	
	LRV	3,756	
	LEV		5,404
	Accrued Payroll		245,392

Esercizio 9

1. a. The managers of each cost center should be involved in setting standards. They understand the actual conditions and are the primary source for information on quantity used and wages paid. The newly designated materials purchasing manager is the information for material prices. Since this is a new position, that individual may not have much information to share, and Annette should go directly to those that did the purchasing in the past. The accounting department, in conjunction with Production, should be able to develop overhead standards and should provide information about past prices and usage.

   b. Standards should be attainable; they should include an allowance for waste, breakdowns, etc. Market prices for materials as well as labor (unions) should be a consideration for setting standards. Labor prices should include fringe benefits, and material prices should include freight, taxes, etc.

2. Once the standards are set, actual results can be compared with the standards and variances can be calculated. Of course, the variances themselves are only indicators of potential problems. The underlying causes of the variances must be determined to decide whether or not corrective action is needed. For this reason, responsibility for the variances will be assigned to those with the most information about them. The variances that will most likely be calculated are:

   Materials Purchase Price Variance—responsibility for this variance lies with the assistant supervisor who was designated the materials purchasing manager. This individual can explain why materials prices were or were not equal to the standard amounts.

   Materials Usage Variance—responsibility for this variance lies with the manager in charge of the Production Department. This individual knows how much was produced and whether or not the amount of materials used equaled the standard.

   Labor Rate Variance—responsibility for this variance lies with the manager in charge of the Production Department. Again, this individual knows whether or not the wage rate used equaled the standard.

   Labor Usage Variance—responsibility for this variance lies with the manager in charge of the Production Department. This individual knows how much was produced and whether or not the amount of labor used equaled the standard.

Esercizio 10

1. Materials:

AP × AQ	SP × AQ	SP × SQ
$3.05 × 46,000	$3 × 46,000	$3 × 48,000
$2,300 *U*	$6,000 *F*	
Price	Usage	

The new process saves 0.25 × 4,000 × $3 = $3,000. Thus, the net savings attributable to the higher-quality material are ($6,000 – $3,000) – $2,300 = $700. Keep the higher-quality material!

2. Labor for new process:

AR × AH	SR × AH	SR × SH
$70,000	$10 × 6,600	$10 × 6,400
$4,000 *U*	$2,000 *U*	
Rate	Efficiency	

The new process gains $3,000 in materials (see Requirement 1) but loses $6,000 from the labor effect, giving a net loss of $3,000. If this pattern is expected to persist, then the new process should be abandoned.

3. Labor for new process, one week later:

AR × AH	SR × AH	SR × SH
$62,000	$10 × 6,000	$10 × 6,400
$2,000 *U*	$4,000 *F*	
Rate	Efficiency	

If this is the pattern, then the new process should be continued. It will save $260,000 per year ($5,000 × 52 weeks). The weekly savings of $5,000 is the materials savings of $3,000 plus labor savings of $2,000.

Esercizio 11

1. Granite:

   MPV = Actual cost – (AQ × SP)
   = \$79,048 – (1,640 × \$50) = \$2,952 *F*

   MUV = (AQ – SQ)SP
   = (1,640 – 1,600)\$50 = \$2,000 *U*

   Glue:

   MPV = Actual cost – (AQ × SP)
   = \$2,560 – (16,000 × \$0.15) = \$160 *U*

   MUV = (AQ – SQ)SP
   = (16,000 – 16,000)\$0.15 = 0

2. Cutting Labor:

   LRV = (AR – SR)AH
   = (\$15 – \$15)180 = 0

   LEV = (AH – SH)SR
   = (180 – 160)\$15 = \$300 *U*

   Installation Labor:

   LRV = (AR – SR)AH
   = (\$25 – \$25)390 = 0

   LEV = (AH – SH)SR
   = (390 – 400)\$25 = \$250 *F*

3. It would probably not be worthwhile for Charlene to establish standards for every different type of installation. Tom and Tony have a small enough operation that they can mentally decide whether or not another type of installation (e.g., one with multiple sink cuts) will be more expensive than the typical one.

Esercizio 12

1.

	Standard Price	Standard Usage	Standard Cost
Direct materials	\$ 4	25.000	\$100.00
Direct labor	15	0.768	11.52
Variable overhead	8	0.768	6.14
Fixed overhead	12	0.768	9.22
Standard cost per unit			\$126.88*

*Rounded

2. There would be unfavorable labor efficiency variances for the first 320 units because the standard hours are much lower than the actual hours at this level. Actual hours would be approximately 409.60 (320 × 1.28), and standard hours would be 245.76 (320 × 0.768). Thus, the labor efficiency variance would be:

   LEV = (AH – SH)SR
   = (409.60 – 245.76)$15
   = $2,457.60 U

3. The cumulative average time per unit is an *average*. For example, the first 40 units take an average of 2.5 hours per unit. The second 40 take an average of 1.5 hours per unit $\frac{(80 \times 2) - (40 \times 2.5)}{40} = 1.5$, and therefore, the average for the first 80 is 2.0 per unit. Thus, as more units are produced, the cumulative average time per unit will decrease. The standard should be 0.768 hour per unit as this is the average time taken per unit once efficiency is achieved:

   $$\frac{(1.024 \times 640) - (1.28 \times 320)}{640 - 320} = 0.768$$

Esercizio 13

1. Normal patient day:

	Standard Price	Standard Usage	Standard Cost
Direct materials	$10.00	8.00 lbs.	$ 80.00
Direct labor	16.00	2 hrs.	32.00
Variable overhead	30.00	2 hrs.	60.00
Fixed overhead	40.00	2 hrs.	80.00
Unit cost			$252.00

   Cesarean patient day:

	Standard Price	Standard Usage	Standard Cost
Direct materials	$10.00	20.00 lbs.	$200.00
Direct labor	16.00	4 hrs.	64.00
Variable overhead	30.00	4 hrs.	120.00
Fixed overhead	40.00	4 hrs.	160.00
Unit cost			$544.00

2. MPV = (AP – SP)AQ
   MPV (Normal) = ($9.50 – $10.00)30,000 = $15,000 *F*
   MPV (Cesarean) = ($9.50 – $10.00)142,000 = $71,000 *F*

   MUV = (AQ – SQ)SP
   MUV (Normal) = [30,000 – (8 × 3,500)]$10 = $20,000 *U*
   MUV (Cesarean) = [142,000 – (20 × 7,000)]$10 = $20,000 *U*

3. LRV = (AR – SR)AH
   LRV (Normal) = ($15.90 – $16.00)7,200 = $720 *F*

LRV (Cesarean) = ($15.90 – $16.00)29,300 = $2,930 *F*

LEV = (AH – SH)SR
LEV (Normal) = [7,200 – (2 × 3,500)]$16 = $3,200 *U*
LEV (Cesarean) = [29,300 – (4 × 7,000)]$16 = $20,800 *U*

4. Yes. Computations are shown below.

   MUV = (172,000 – 28,000 – 140,000)$10 = $40,000 *U*
   LEV = (36,500 – 35,000)$16 = $24,000 *U*

5. Answers will vary.

Esercizio 14

1. Liquid standard = 4.2 × 250,000 × $0.25 = $262,500

   Upper control limit (UCL): $288,750 or $282,500; lesser = $282,500
   Lower control limit (LCL): $236,250 or $242,500; greater = $242,500

   Bottle standard = 250,000 × $0.05 = $12,500

   UCL: $13,750
   LCL: $11,250

   Direct labor standard = 0.2 × 250,000 × $12.50 = $625,000

   UCL: $687,500 or $645,000; lesser = $645,000
   LCL: $562,500 or $605,000; greater = $605,000

2. Total liquid variance = $310,500 – $262,500 = $48,000 *U*

   MPV = ($0.27 – $0.25)1,150,000 = $23,000 *U*
   MUV = (1,150,000 – 1,050,000)$0.25 = $25,000 *U*

   The liquid variances would be investigated as the total variance exceeds $20,000, as does each individual variance.

   Total bottle variance = $12,000 – $12,500 = $500 *F*

   MPV = ($0.048 – $0.05)250,000 = $500 *F*
   MUV = (250,000 – 250,000)$0.05 = 0

   The bottle variances would not be investigated as the total variance is within the accepted limits.

3. Total labor variance = $622,425 – $625,000 = $2,575 *F*

   LRV = ($12.90 – $12.50)48,250 = $19,300 *U*
   LEV = (48,250 – 50,000)$12.50 = $21,875 *F*

   The total variance is within the limits. However, the labor efficiency variance is greater than $20,000 and should be investigated.

Esercizio 15

1. April (UCL = Upper control limit, and LCL = Lower control limit)

   Materials:

   Price standard: $0.25 × 723,000 = $180,750
   UCL: 0.08 × $180,750 = $14,460
   LCL: ($14,460)

   Quantity standard: 8 × 90,000 × $0.25 = $180,000
   UCL: 0.08 × $180,000 = $14,400
   LCL: ($14,400)

   Labor:

   Price standard: $7.50 × 36,000 = $270,000
   UCL: 0.08 × $270,000 = $21,600
   LCL: ($21,600)

   Quantity standard: 0.4 × 90,000 × $7.50 = $270,000
   UCL: 0.08 × $270,000 = $21,600
   LCL: ($21,600)

   May

   Materials:

   Price standard: $0.25 × 870,000 = $217,500
   UCL: 0.08 × $217,500 = $17,400
   LCL: ($17,400)

   Quantity standard: 8 × 100,000 × $0.25 = $200,000
   UCL: 0.08 × $200,000 = $16,000
   LCL: ($16,000)

   Labor:

   Price standard: $7.50 × 44,000 = $330,000
   UCL: 0.08 × $330,000 = $26,400
   LCL: ($26,400)

   Quantity standard: 0.4 × 100,000 × $7.50 = $300,000
   UCL: 0.08 × $300,000 = $24,000
   LCL: ($24,000)

   June

   Materials:

   Price standard: $0.25 × 885,000 = $221,250
   UCL: 0.08 × $221,250 = $17,700
   LCL: ($17,700)

   Quantity standard: 8 × 110,000 × $0.25 = $220,000
   UCL: 0.08 × $220,000 = $17,600

LCL: ($17,600)

Labor:

Price standard: $7.50 × 46,000 = $345,000
UCL: 0.08 × $345,000 = $27,600
LCL: ($27,600)

Quantity standard: 0.4 × 110,000 × $7.50 = $330,000
UCL: 0.08 × $330,000 = $26,400
LCL: ($26,400)

2.

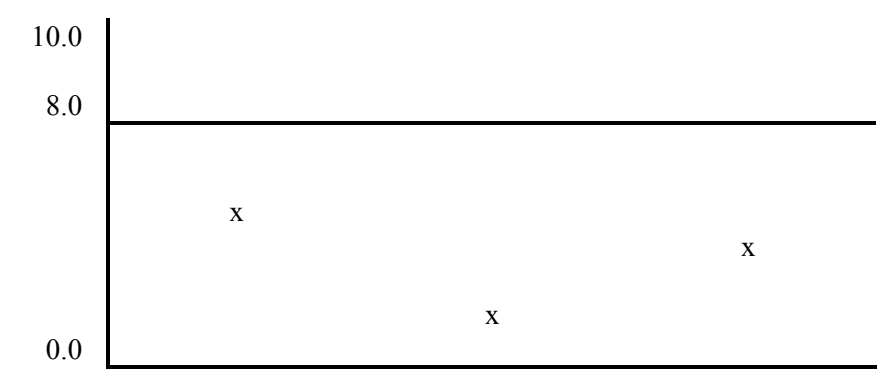
April		Limit	Actual*
MPV	= ($0.2614 – $0.25)723,000 = $8,242 *U*	$ ± 14,460	4.6%
MUV	= (723,000 – 720,000)$0.25 = $750 *U*	± 14,400	0.4
LRV	= ($7.50 – $7.50)36,000 = 0	± 21,600	0.0
LEV	= (36,000 – 36,000)$7.50 = 0	± 21,600	0.0
May			
MPV	= ($0.2506 – $0.25)870,000 = $522 *U*	± 17,400	0.2%
MUV	= (870,000 – 800,000)$0.25 = $17,500 *U*	± 16,000**	8.8
LRV	= ($7.341 – $7.50)44,000 = $6,996 *F*	± 26,400	(2.1)
LEV	= (44,000 – 40,000)$7.50 = $30,000 *U*	± 24,000**	10.0
June			
MPV	= ($0.2599 – $0.25)885,000 = $8,762 *U*	± 17,700	4.0%
MUV	= (885,000 – 880,000)$0.25 = $1,250 *U*	± 17,600	0.6
LRV	= ($7.826 – $7.50)46,000 = $14,996 *U*	± 27,600	4.3
LEV	= (46,000 – 44,000)$7.50 = $15,000 *U*	± 26,400	4.5

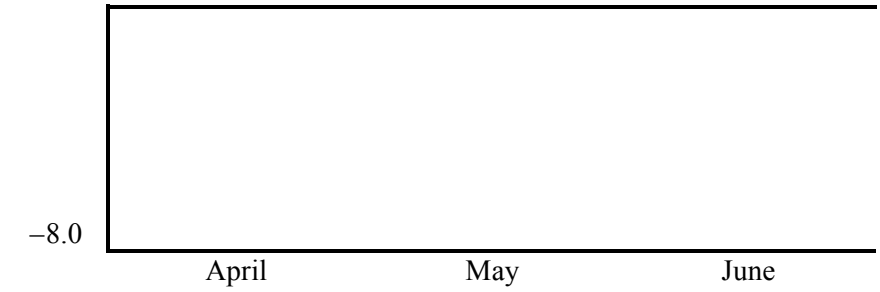
* The actual deviation divided by the total price or quantity.
** Investigate May's MUV and LEV.

3. Control charts allow us to see when the variances are outside an acceptable range. They may also show a pattern that might help in pinpointing when the problem began.

Control charts: To simplify the presentation, the variances are expressed as a percentage of the total quantity or price standard, and the y-axis is used for variances. These percentages were calculated in Requirement 2.

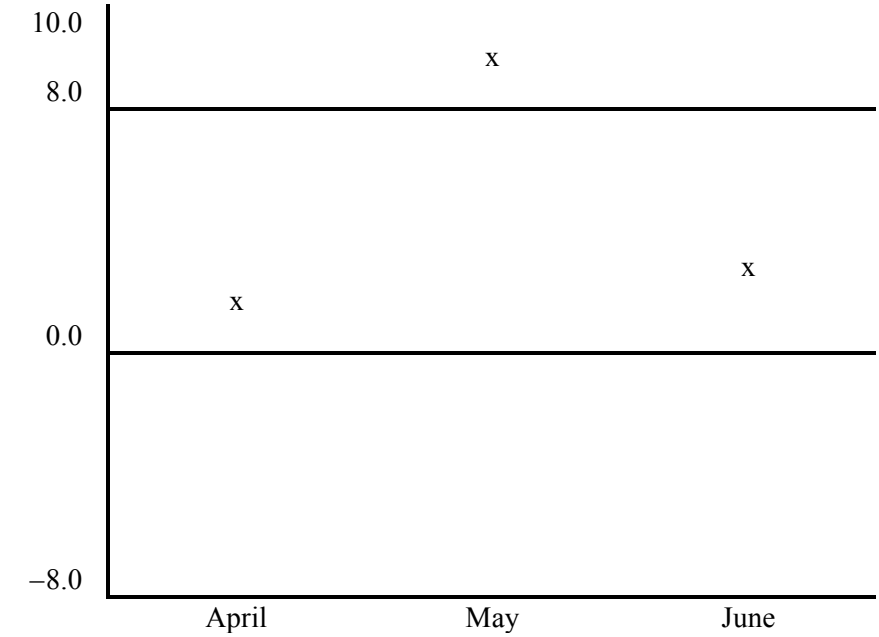
MPV:




−8.0
April
May
June

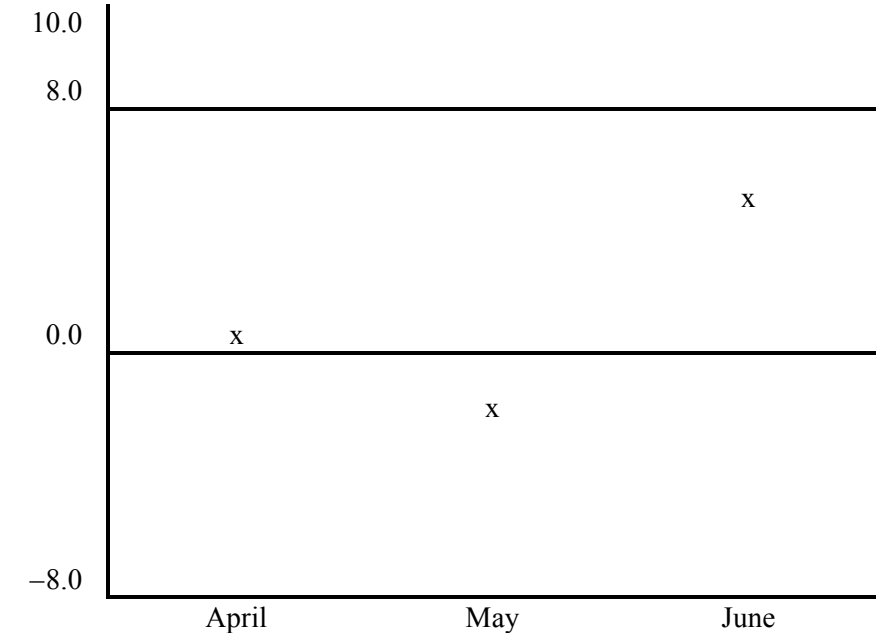
MUV:

%

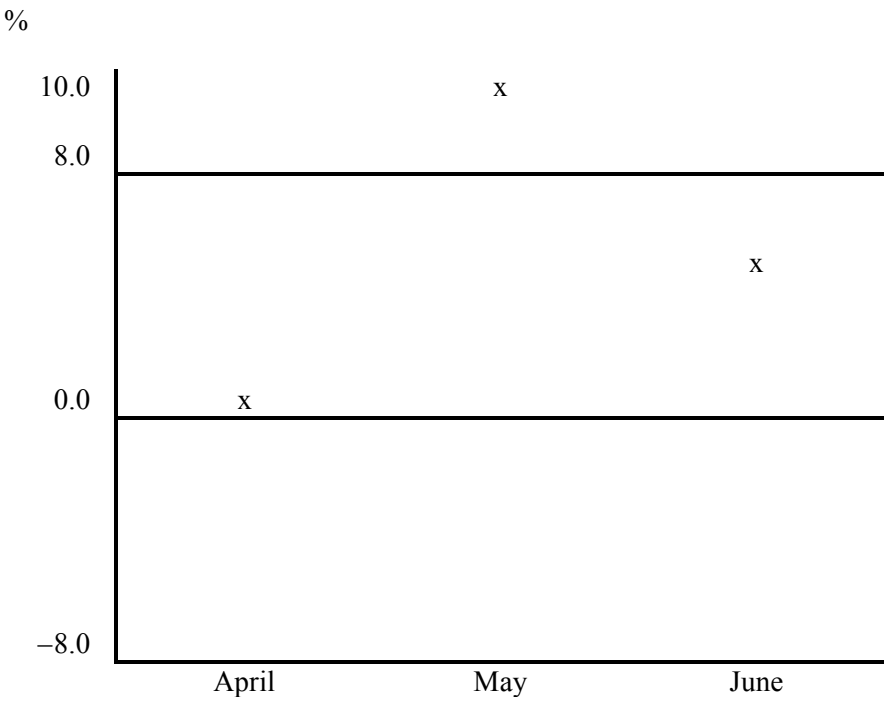

10.0
8.0
0.0
−8.0
x
x
x
April
May
June

LRV:

%


10.0
8.0
0.0
−8.0
x
x
x
April
May
June

LEV:



Esercizio 16

1. MPV = (AP – SP)AQ
   = ($1.05 – $1.00)19,500 = $975 *U*

   MUV = (AQ – SQ)SP
   = (19,500 – 20,000)$1 = $500 *F*

   The overall materials variance is $475 *U* ($975*U* – $500*F*); therefore, the company should not buy this quality of materials, but should go back to the prior quality.

2. LRV = (AR × AH) – (SR × AH)
   = Actual labor cost – (SR × AH)
   = $42,000 – ($10 × 4,100) = $1,000 *U*

   LEV = (SR × AH) – (SR × SH)
   = ($10 × 4,100) – ($10 × 4,000) = $1,000 *U*

   The overall labor variance is $2,000 U ($1,000 + $1,000). If this pattern is expected to persist, then the new layout should be abandoned.

3. LRV = (AR × AH) – (SR × AH)
   = Actual labor cost – (SR × AH)
   = $39,000 – ($10 × 3,900) = $0

   LEV = (SR × AH) – (SR × SH)
   = ($10 × 3,900) – ($10 × 4,000) = $1,000 *F*

   The overall labor variance is $1,000 *F* (0 + $1,000 *F*). If this pattern is the one expected to persist, then the new layout should be continued. It will save $52,000 per year ($1,000 × 52 weeks).

Esercizio 17

1. MPV = (AQ × AP) – (SP × AQ)
   = Actual materials cost – (SP × AQ)
   = $40,000 – ($0.80)52,000 = $1,600 *F*

   MUV = (AQ – SQ)SP
   = (52,000 – 50,000)($0.80) = $1,600 *U*

   Overall materials variance = $1,600 *F* + $1,600 *U* = 0

2. LRV = (AR × AH) – (SR × AH)
   = Actual labor cost – (SR × AH)
   = $236,910 – ($16 × 14,900) = $1,490 *F*

   LEV = (SR × AH) – (SR × SH)
   = ($16 × 14,900) – ($16 × 15,000) = $1,600 *F*

Conclusioni:

3. The basic advantages offered by a standard costing system include its use in planning, control, and decision making. A standard costing system helps in budgeting since the unit standard costs can be multiplied by the predicted level of production to obtain total costs. Standard costs are used in control to evaluate performance. A comparison of actual costs to standard costs allows management to evaluate the performances of cost centers. Finally, standard costs assist in decision making. For example, having standard costs can make pricing decisions easier.

   Standard costing systems also have disadvantages. For example, standards that are set too high (e.g., theoretical or perfect standards) can cause motivation to decrease, as workers believe that they can never achieve the standards. Standards may also stand in the way of continual improvement if they are not updated frequently to adjust for gradual increases in efficiency.

Esercizio 18

1. MPV = (AP – SP)AQ
   = ($4.70 – $5.00)260,000 = $78,000 *F*

   MUV = (AQ – SQ)SP
   = (320,000 – 300,000)$5 = $100,000 *U*

   The materials usage variance is viewed as the most controllable because prices for materials are often market-driven and thus not controllable. Responsibility for the variance in this case likely would be assigned to Purchasing. The lower-quality materials are probably the cause of the extra usage.

2. LRV = (AR – SR)AH
   = ($13 – $12)82,000 = $82,000 *U*

   LEV = (AH – SH)SR
   = (82,000 – 80,000)$12 = $24,000 *U*

AR × AH	SR × AH	SR × SH

$13 × 82,000	$12 × 82,000	$12 × 80,000
$82,000 *U*	$24,000 *U*	
Rate	Efficiency	

Production is usually responsible for labor efficiency. In this case, efficiency may have been affected by the lower-quality materials, and Purchasing, thus, may have significant responsibility for the outcome. Other possible causes are less demand than expected, poor supervision, lack of proper training, and lack of experience.

3. Three variances are potentially affected by material quality:

MPV	$ 78,000 *F*
MUV	100,000 *U*
LEV	24,000 *U*
Net effect	$ 46,000 *U*

If the variance outcomes are largely attributable to the lower-quality materials, then the company should discontinue using this material.

4.

Materials	1,300,000	
MPV		78,000
Accounts Payable		1,222,000
Work in Process	1,500,000	
MUV	100,000	
Materials		1,600,000
Work in Process	960,000	
LRV	82,000	
LEV	24,000	
Accrued Payroll		1,066,000
Cost of Goods Sold	206,000	
MUV		100,000
LRV		82,000
LEV		24,000
MPV	78,000	
Cost of Goods Sold		78,000

Esercizio 19

1. By using a standard costing system, Crunchy Chips can increase control of its manufacturing inputs. By developing price and quantity standards for each input, management can compute price and usage variances for each input. Since a standard costing system provides more information, control is enhanced. For example, since managers have the most control over usage of inputs, knowing the usage variances provides specific information about where action is needed. Moreover, by breaking out price variances, which are not as controllable, performance evaluation is improved.

2. The engineering standards are ideal standards. The president's concern is probably reflecting doubt that the labor standards can be achieved. If pressure is applied to workers to achieve perfection standards, the outcome is likely to be unsatisfactory. Workers may become frustrated and lower their performance as a consequence. Many firms elect to use currently attainable standards in lieu of ideal standards. The

standard suggested by the president is a good starting point. If experience indicates that his standard is too loose, then the standard can be adjusted later on.

3. Standard cost sheet (for one box of chips):

Direct materials		
	Potatoes (15.9375 lbs. @ $0.238)*	$3.7931
	Cooking oil (49.5 oz. @ $0.04)	1.9800
	Bags (15 @ $0.11)	1.6500
	Boxes (1 @ $0.52)	0.5200
$7.9431		

*Pounds per box = $15 \times 4 \times \frac{4.25}{16} = 15.9375$

Price per pound = $0.245 less scrap value; scrap per box = 15 × (17.0 ounces – 16.3 ounces) = 10.5 ounces. $\frac{\text{Scrap value}}{\text{ounce}} = \frac{\$0.16}{16} = \$0.01$ per ounce. Scrap savings per box is $0.01 × 10.5 = $0.105, and the savings per pound of potato is $\frac{\$0.105}{15.9375} = \$0.007$. Thus, the standard price per pound of potato is $0.245 – $0.007 = $0.238.

Direct labor**		
	Potato inspection (0.006 hr. @ $15.20)	$0.0912
	Chip inspection (0.0225 hr. @ $10.30)	0.2318
	Frying monitor (0.0118 hr. @ $14.00)	0.1652
	Boxing (0.0311 hr. @ $11.00)	0.3421
	Machine operators (0.0118 hr. @ $13.00)	0.1534 0.9837
Variable overhead ($0.9837 × 1.16)		1.1411
Fixed overhead ($0.9837 × 1.9671)***		1.9350
Cost per box		$12.0029
	Cost per bag $\frac{\$12.0029}{15}$	$ 0.8002

** $\frac{\text{Number of boxes}}{\text{year}} = \frac{8{,}800{,}000}{15} = 586{,}667$

Hours/box:

Potato inspection: $\frac{3{,}200 \times 1.1}{586{,}667}$

Chip inspection: $\frac{12{,}000 \times 1.1}{586{,}667}$

Frying monitor: $\frac{6{,}300 \times 1.1}{586{,}667}$

Boxing: $\frac{16{,}600 \times 1.1}{586{,}667}$

Machine operators: $\frac{6{,}300 \times 1.1}{586{,}667}$

*** $\frac{\$1{,}135{,}216}{\$0.9837 \times 586{,}667}$ = Fixed OH rate based on labor dollars.

4. MUV = (AQ – SQ)SP
   = (9,500,000 – 9,350,000)$0.238
   = $35,700 *U*

$$SQ = 15.9375 \times \frac{8{,}800{,}000}{15} = 9{,}350{,}000$$

Esercizio 20

1. Pat's decision was wrong and not in the best interests of the company. His concern for his bonus and promotion was apparently more important than his company's reputation for a quality product. Unfortunately, his assessment of personal risk was probably a significant input to the decision to buy the inferior component. All too often, individuals decide to take an unethical course of action based on their assessment of their chances of getting caught. This obviously should not be a factor. What is right should be the driving concern for this type of decision.
2. The use of standards to evaluate performance and assess rewards apparently was influential in Pat's decision. He clearly had a desire to receive his annual bonus and wanted to present an impressive performance profile so that he could secure a position at division headquarters. Perhaps altering the factors used for evaluating and rewarding performance and increasing the tenure of managers may decrease this type of behavior. Or perhaps we ought to spend more time emphasizing ethical behavior—maybe the problem isn't so much the systems we use for evaluating and rewarding performance but rather the lack of commitment to ethical decision making.
3. Purchasing agents have ethical responsibilities similar to accountants. Integrity is a universally desirable characteristic. Pat and other purchasing agents should refrain from engaging in any activity that would prejudice their abilities to carry out their duties ethically (III-2); refuse any gift, favor (e.g., bonus), or hospitality that would influence their actions; and refrain from either actively or passively subverting the attainment of the organization's legitimate and ethical objectives (III-4). Organizations would be well advised to adopt a set of ethical standards. All employees should understand that certain behaviors are unacceptable.
4. Answers will vary.