of the dollar carrying amounts for the raw materials, work in process, and finished goods inventory master files with their respective general ledger control accounts. Third, through periodic inspections of inventory condition and management review of inventory activity reports, adjustments to reduce inventory carrying values to market should be made when required (EO1, C1,VA1, VA4).

Management Controls

Management controls are often used to monitor each function described above. When management is held accountable for the use of resources at each stage of production, the likelihood of unintentional errors is decreased. As described above, management usually will closely monitor production orders, labor and materials used, the total accumulation of production costs, the existence of inventory, and the approval of standard costs (EO1, C1, VA1, PD1).

Additional Inventory Controls

Controls over cost of goods sold vary with the nature of the accounting system. Many companies use a perpetual inventory system only to track inventory quantities. They then use a periodic inventory system to value inventory. Production costs might be tracked by raw materials and conversion costs. At year-end inventory is valued using the entity's chosen valuation method (LIFO, FIFO, Retail Method, etc.). The cost of goods sold is determined by adding production costs to beginning inventory and subtracting ending inventory.

The accuracy of cost of goods sold (EO2, C2, VA2, and PD2) depends on controls over (1) the accumulation of production costs and (2) the valuation of ending inventory. In a strong system of internal control there is usually an independent review of manufacturing variances. If variances are due to inefficient production, they should be treated as a period cost and charged directly to cost of goods sold. If variances occur because standard costs no longer reflect the actual cost of production, an argument can be made for including an appropriate portion of the variances in inventory. There should also be an independent review of the valuation of inventory at the end of the year.

Finally, internal controls over disclosure objectives (PD3-PD6) require the diligent work of an effective disclosure committee.

LEARNING CHECK

16-1 a. Describe the nature of the production cycle.
b. Identify the major transaction class within this cycle.
c. Name three other cycles that interface with the production cycle.

16-2 a. Identify several transaction class audit objectives for the production cycle.
b. Identify several account balance audit objectives for the production cycle.

16-3 a. Discuss materiality from the perspective of the production cycle.
b. Discuss inherent risk from the perspective of the production cycle.
c. Describe three analytical procedures an auditor might use when auditing the production cycle, and describe how each analytical procedure might identify a potential misstatement in the financial statements.

16-4 a. Explain several control environment factors that impact the production cycle.
b. Identify several unique elements of an entity's accounting information system that pertain to the production cycle.

16-5 Identify the documents, records, and computer files that provide a basis of authorization and control in the four functions that culminate in transferring production to finished goods.

16-6 What controls are important in determining and recording manufacturing costs?

16-7 What controls are important in protecting inventories and maintaining the correctness of inventory balances?

KEY TERMS

Completed production report, p. 750
Daily production report, p. 750
Finished goods inventory master file, p. 750
Manufacturing transactions, p. 744
Material requirements report, p. 750
Materials issue slip, p. 750
Move ticket, p. 750
Production cycle, p. 744
Production order, p. 750
Raw materials inventory master file, p. 750
Standard cost master file, p. 750
Time ticket, p. 750
Work-in-progress inventory master file, p. 750

PRELIMINARY AUDIT STRATEGIES

Audit Decision 4

■ What factors are involved in determining an acceptable level of tests of details risk for inventory assertions?

Figure 16-7 summarizes some key issues related to preliminary audit strategies for the audit of inventory. Inventory audits usually face significant inherent risks for the existence and occurrence assertion and the valuation and allocation assertion. If internal controls are strong, auditors often think about moving the timing of inventory observations to an interim date and they can reduce the extent of inventory observations. If internal controls are weak, inventory observations should be performed at year-end and the extent of inventory observations should be increased.

POSSIBLE SUBSTANTIVE TESTS OF INVENTORY ASSERTIONS

Audit Decision 5

■ How does the auditor determine the elements of an audit program for substantive tests to achieve specific audit objectives for inventory?

Possible substantive tests of inventory balance assertions and the specific account balance audit objectives to which they relate are shown in Figure 16-8. Evidence from some of the tests applicable to merchandise inventory and to manufactured finished goods inventories also relates to objectives for the corresponding cost of goods sold accounts because of the reciprocal relationship of these accounts. Each of the substantive tests is discussed in a following section, together with selected comments about how the tests can be tailored based on the acceptable level of detection risk to be achieved.

Initial Procedures

An essential initial procedure involves obtaining an understanding of the entity's business and industry. This allows the auditor to develop a knowledgeable

Figure 16-7 ■ Preliminary Audit Strategies for Inventory

Assertion	Inherent Risk	Control Risk	Analytical Procedures Risk	Test of Details Risk
Existence and Occurrence	Maximum: There are significant inherent risks associated with the susceptibility of inventory to theft and inventory counts may be overstated as part of fraudulent financial reporting to improve gross margins.	Low: A strong perpetual inventory system with regular test counts of the physical against the perpetual inventory.	High: Analytical procedures are often too blunt to restrict detection risk to a low level for the existence of inventory.	Moderate: If internal controls are strong the auditor may observe the existence of inventory prior to year-end. Extent of testing depends on the level of test of details risk.
Completeness	Moderate to High: Understatements of inventory may result from poor inventory counts or cutoff errors.	Low: A strong perpetual inventory system with regular test counts of the physical against the perpetual inventory.	High: Analytical procedures are often too blunt to restrict detection risk to a low level for the completeness of inventory.	Moderate: If internal controls are strong the auditor may test the completeness of inventory during inventory observations prior to year-end.
Rights and Obligations	High: A company may have consignment inventory on hand that it does not own, or inventory may be pledged as security for a loan.	Moderate or Low: A perpetual inventory system must track consignment inventory, and regular test counts should be made. The perpetual should also be compared with monthly statements from vendors.	Maximum: Analytical procedures are not directed at the rights and obligations assertion.	Low: Direct confirmation of borrowing arrangements will include information about assets pledged as security for loans. The auditor will also read the contracts to understand terms of borrowing.
Valuation or Allocation	Maximum: Significant inherent risks associated with valuation issues, including the appropriate application of valuation methods (LIFO, FIFO, etc.) and lower of cost or market issues.	Moderate or Low: Figure 16-6 explains a number of controls over the value of manufactured inventory. An effective disclosure committee should regularly review lower of cost or market issues.	High: Analytical procedures are often too blunt to provide restrict detection risk to a low level for the valuation assertion.	Low: The auditor must substantively test the valuation at historical cost and lower of cost or market issues. Extent of testing depends on the level of test of details risk.
Presentation or Disclosure	Moderate: Inventory disclosures are straightforward and not extensive.	Moderate or Maximum: Primary control is the involvement of an effective disclosure committee.	Maximum: Analytical procedures are not directed at disclosures.	Very Low: The auditor will often perform tests of details to evaluate the quality and accuracy of financial statement disclosures. The auditor will also read the contracts to understand terms of borrowing.

Figure 16-8 ■ Possible Substantive Tests of Inventory Assertions

Category	Substantive Test	Specific Audit Objectives
Initial Procedures	1. Obtain an understanding of the business and industry and determine:	All
	a. The significance of cost of sales and inventory to the business	
	b. Key economic drivers that influence the entity's cost of sales gross margins and the possibility of obsolete inventory.	
	c. The extent to which the client has consignment inventories (in or out)	
	d. The existence of purchase commitments and concentration of activities with suppliers.	
	2. Perform initial procedures on inventory balances and records that will be subjected to further testing.	
	a. Trace beginning inventory balances to prior year's working papers.	VA3
	b. Review activity in inventory accounts and investigate entries that appear unusual in amount or source.	EO3, VA3, PD3
	c. Verify totals of perpetual records and other inventory schedules and their agreement with general ledger balances.	VA3
Analytical Procedures	3. Perform analytical procedures.	All
	a. Review industry experience and trends.	
	b. Examine analysis of inventory turnover.	
	c. Review relationship of inventory balances to recent purchasing, production, and sales activities.	
	d. Compare inventory balances to anticipated sales volume.	
Tests of Details of Transactions	4. On a test basis, vouch entries in inventory to supporting documentation (e.g., vendor's invoices, manufacturing cost records, completed production reports, and sales and sales return records).	EO1, EO2, VA1, V2, PD1, PD2
	5. On a test basis, trace data from purchases, manufacturing, completed production, and sales records to inventory accounts.	C1, C2
	6. Test cutoff of purchases and sales returns (receiving), movement of goods through manufacturing departments (routing), and sales (shipping).	EO1, EO2, C1, C2
Tests of Details of Balances	7. Observe client's physical inventory count.	
	a. Decide on timing and extent of tests.	EO3, C3
	b. Evaluate adequacy of clients inventory taking plans.	EO3, C3
	c. Observe care taken in client's counts and make test counts.	EO3, C3
	d. Look for indications of slow-moving, damaged, or obsolete inventory.	VA4
	e. Account for all inventory tags and count sheets used in physical count.	EO3, C3
	8. Test clerical accuracy of inventory listings.	
	a. Recalculate totals and extensions of quantities times unit prices.	VA3
	b. Trace test counts (from item 7c) to listings.	C3
	c. Vouch items on listings to inventory tags and count sheets.	EO3
	d. Reconcile physical counts to perpetual records and general ledger balances and review adjusting entries.	EO3, C3, VA3, PD3
	9. Test inventory pricing.	
	a. Examine vendors' paid invoices for purchased inventories.	VA3
	b. Examine propriety of direct labor and overhead rates, standard costs, and disposition of variances pertaining to manufactured inventory.	VA3
	10. Confirm inventories at locations outside the entity.	EO3, C3, RO1
	11. Examine consignment agreements and contracts.	RO1
	12. Based on the tests of beginning inventory, production costs, and ending inventory, determine the appropriateness of cost of sales.	EO2, C2, VA2, PD2

(continues)

Figure 16-8 ■ (Continued)

Category	Substantive Test	Specific Audit Objectives
Tests of Details of Balances: Accounting Estimates	13. Evaluate the net realizable value of inventory:	
	a. Examine sales invoices after year-end and perform lower of cost or market test.	VA4
	b. Compare inventories with entity's current sales catalogue and sales reports.	VA4
	c. Inquire about slow-moving, excess, or obsolete inventories and determine need for write-down.	VA4
	d. Evaluate management's process for estimating the net realizable value of inventory using hindsight.	VA4
	e. Evaluate the net realizable value of inventory given information about: • Industry trends • Inventory turnover trends • Specific slow-moving inventory	VA4
Required Procedure	14. Observation of physical inventory count included as step 7 above.	EO3, C3
Presentation and Disclosure	15. Compare statement presentation with GAAP.	
	a. Confirm agreements for assigning and pledging inventories.	PD3, PD6
	b. Review presentation and disclosure for inventories in drafts of the financial statements and determine conformity with GAAP.	PD3, PD6
	c. Evaluate the completeness of presentation and disclosures for inventories in drafts of financial statements to determine conformity to GAAP by reference to disclosure checklist.	PD4
	d. Read disclosures and independently evaluate their classification and understandability.	PD5

perspective about the entity and set the context for the evaluation of analytical procedures and tests of details. If the client is a manufacturer, it is particularly important to understand the mix of fixed costs and variable costs involved in the manufacturing process. If a manufacturer is particularly capital intensive, it will need a high volume of activity, perhaps operating at 80 to 90 percent of capacity, to achieve breakeven profitability. If the entity is a retailer, it is important to understand the sources of supply of products and the role the client plays in the distribution chain. The auditor also should understand the importance of consignment inventories, whether consignments in or consignments out, to the client's business.

In tracing beginning inventory balances to prior-year working papers, the auditor should make certain that any audit adjustments agreed upon in the prior year did in fact get recorded. In addition, current-period entries in the general ledger inventory accounts should be scanned to identify any postings that are unusual in amount or nature and require special investigation. Initial procedures also involve determining that the detailed perpetual or other inventory schedules tie in with the general ledger balances. Additional work on inventory listings prepared on the basis of the physical inventory is discussed in a later section dealing with tests of details of balances.

Analytical Procedures

The application of analytical procedures to inventories uses the auditor's knowledge of the entity and its environment to develop expectations about the financial statements. This knowledgeable perspective is effective in identifying accounts that may be misstated. Suggested analytical procedures are presented in Figure 16-4 and by the steps shown in Figure 16-8. A review of industry experience and trends may be essential in developing expectations to be used in evaluating analytical data for the client. For example, knowing that a sharp drop in the client's inventory turnover ratio mirrors what is happening in the industry may help the auditor in concluding that the drop is not indicative of errors pertaining to existence or occurrence or completeness of the client data used in calculating the inventory turnover ratio, but may instead be indicative of a valuation problem related to a drop in demand that is likely to be followed by falling market prices. A review of relationships of inventory balances to recent purchasing, production, and sales activities should also aid the auditor in understanding changes in inventory levels. For example, an increase in the reported level of finished goods inventory when purchasing, production, and sales levels have remained steady might be indicative of misstatements related to the existence or valuation of the finished goods inventory. In addition to the calculation of an overall inventory turnover ratio for each inventory account, it may be appropriate to calculate the ratio for disaggregated data, such as by product line.

Because of the reciprocal relationship between inventories and cost of goods sold, these procedures may provide evidence useful in determining the fairness of management's assertions pertaining to both accounts. For example, an unexpectedly high inventory turnover ratio or an unexpectedly low gross margin might be caused by an overstatement of cost of goods sold and corresponding understatement of inventories. The auditor should also understand and evaluate the degree to which manufacturing costs are fixed and variable, and the relationship between costs, volume, and gross profit. Conversely, conformity of these ratios with expectations may provide some limited assurance of the fairness of the historical data used in the calculations unless evidence from other sources is contradictory. Finally, analysis of inventory levels and ratios based on anticipated sales volume in the subsequent period may be useful in conjunction with the market valuation tests discussed in a later section.

Tests of Details of Transactions

These tests involve the procedures of vouching and tracing to obtain evidence about the processing of individual transactions that affect inventory balances. Special consideration is given to determining the propriety of the cutoff of inventory transactions at the end of the accounting period.

Test Entries to Inventory Accounts

Some or all of this type of testing may be done as part of dual-purpose tests during interim work. Examples of vouching recorded entries in inventory accounts include the vouching of

- Debits in merchandise or raw materials inventories to vendors' invoices, receiving reports, and purchase orders.
- Debits in work-in-process or finished goods inventories to manufacturing cost records and production reports.
- Credits to merchandise and finished goods inventories to sales documents and records.

- Credits to raw materials and work-in-process inventories to manufacturing cost records and production reports.

Recall that vouching entries that increase inventory balances provides evidence about the existence and valuation of the inventory at the time of the transaction. Vouching entries that decrease inventory balances to determine the propriety of the inventory reductions provides further evidence about the valuation assertion for cost of goods sold. Tracing documentation for purchases and the cost of factors added to production to entries in the inventory accounts provides evidence for the completeness and valuation inventory assertions. Tracing documentation of transactions that decrease inventory balances, such as sales, to determine that entries were recorded and at the right amounts provides further evidence for the existence and valuation assertions for inventory. Tracing and vouching also contribute evidence for the rights and obligations (ownership) assertion for inventories.

Test Cutoff of Purchases, Manufacturing, and Sales Transactions

The purpose and nature of sales and purchases cutoff tests are explained in Chapters 14 and 15, respectively, in connection with the audit of accounts receivable and accounts payable balances. Both tests are important in establishing that transactions occurring near the end of the year are recorded in the correct accounting period. In a manufacturing company, it must also be determined that entries are recorded in the proper period for the transfer of costs for goods moved between (1) stores and production departments, (2) one production department and another, or (3) production departments and finished goods.

In each case, the auditor must ascertain through inspection of documents and physical observation that the paperwork cutoff and the physical cutoff for inventory taking are coordinated. For example, if the auditor determines that an entry transferring the cost of the period's last lot of completed production to finished goods has been recorded, he or she should determine that the goods, even if in transit, were included in the physical inventory of finished goods only—that is, that they were neither counted as part of work in process, nor double counted, nor missed altogether. Evidence from these cutoff tests relates to both the existence or occurrence and completeness assertions for inventory balances and cost of goods sold.

Tests of Details of Balances

Figure 16-8 shows a number of tests of balances related to the requirement of observing the client's physical inventory.

Observation of the Client's Physical Inventory Count

The observation of inventories has been a generally accepted auditing procedure for more than 60 years. This procedure is required whenever inventories are material to a company's financial statements and it is practicable and reasonable. The observation of inventories may prove to be inconvenient, time consuming, and difficult for the auditor, but it is seldom impracticable and unreasonable.

In performing this auditing procedure, the client has responsibility for the taking of the inventory. AU 331, *Inventories,* states that from this substantive test, the auditor obtains direct knowledge of the effectiveness of the client's inventory tak-

seeing is believing

During the 1930s, audit evidence for inventories was usually restricted to obtaining a certification from management as to the correctness of the stated amount. In 1938, the discovery of a major fraud in the McKesson & Robbins Company, a major pharmaceutical firm, caused a reappraisal of the auditor's responsibilities for inventories. The company's December 1937 financial statements "certified" by a national public accounting firm reported $87 million of total assets. Of this amount, $19 million was subsequently determined to be fictitious: $10 million in inventory and $9 million in receivables. The auditors were exonerated of blame because they had complied with existing auditing standards. However, promptly thereafter, in Statement on Auditing Procedure No. 1, auditing standards were changed to include physical observation of inventories.

Source: SEC Financial Reporting Release No. 1.

ing and the measure of reliance that may be placed on management's assertions as to the quantities and physical condition of the inventories. The primary audit considerations applicable to this required procedure are explained in the following subsections.

Timing and Extent of the Test

The timing of an inventory observation depends on the client's inventory system and the effectiveness of internal controls. In a periodic inventory system, quantities are determined by a physical count, and all counts are made as of a specific date. The date should be at or near the balance sheet date, and the auditor should ordinarily be present on the specific date.

In a perpetual inventory system with effective internal controls, physical counts may be taken and compared with inventory records at interim dates. When the perpetual records are well kept and comparisons with physical counts are made periodically by the client, the auditor should be present to observe a representative sample of such counts. In such cases, this procedure may occur either during or after the end of the period under audit. In companies where inventories are at multiple locations, the auditor's observations ordinarily should encompass all significant inventory locations.

Inventory-Taking Plans

The taking of a physical inventory by a client is usually done according to a plan or a list of instructions. The client's instructions should include such matters as the:

- Names of employees responsible for supervising the inventory taking
- Date of the counts
- Locations to be counted
- Detailed instructions on how the counts are to be made
- Use and control of prenumbered inventory tags and summary (compilation) sheets

- Provisions for handling the receipt, shipment, and movement of goods during the counts if such activity is unavoidable
- Segregation or identification of goods not owned

The auditor must do advanced planning if an inventory observation is to be done efficiently and effectively. An experienced auditor usually has the responsibility for (1) planning the procedure, (2) determining the manpower needs, and (3) assigning members of the audit team to specific locations. Each observer should be provided with a copy of the client's inventory plans and written instructions of his or her duties.

Performing the Test

In observing inventories, the auditor should:

- Scrutinize the care with which client employees are following the inventory plan.
- See that all merchandise is tagged and no items are double tagged.
- Determine that prenumbered inventory tags and compilation sheets are properly controlled.
- Make some test counts and trace quantities to compilation sheets.
- Be alert for empty containers and hollow squares (empty spaces) that may exist when goods are stacked in solid formations.
- Watch for damaged and obsolete inventory items.
- Appraise the general condition of the inventory.
- Identify the last receiving and shipping documents used and determine that goods received during the count are properly segregated.
- Inquire about the existence of slow-moving inventory items.

The extent of the auditor's test counts depends, in part, on the care exercised by client employees in taking the inventory, the nature and composition of the inventory, and the effectiveness of controls pertaining to both the physical safeguarding of the inventory and the maintenance of perpetual records. Ordinarily, the auditor will stratify the inventory items to include the items of highest dollar value in the count and take a representative sample of other items. Perpetual inventory records are helpful in identifying the high-value items and selecting the sample items.

In making test counts, the auditor should record the count and give a complete and accurate description of the item (identification number, unit of measurement, location, etc.) in the working papers as shown in Figure 16-9. Such data are essential for the auditor's comparison of the test counts with the client's counts, and the subsequent tracing of the counts to inventory summary sheets and perpetual inventory records. After the inventory has been counted, the auditor needs to make a listing of all tags (used or unused) or summary sheets and obtain sufficient information so that no inventory can be added to the count after the auditor has observed inventory. Several significant frauds have occurred, overstating inventory, when the auditor has not adequately controlled the count sheets or tags.

On conclusion of the observation procedure, a designated member of the audit team should prepare an overall summary. The summary should include a description of such matters as (1) departures from the client's inventory-taking plan, (2)

Figure 16-9 ■ Inventory Test Counts Working Paper

Highlift Company

W/P Ref. *F – 2*
Raw Materials Test Counts
December 31, 20X1

Prepared By: *W.C.B.* Date: *12/31/X1*
Reviewed By: *R. E. Z.* Date: *1/25/X2*

Tag No.	Inventory Sheet No.	Inventory Number	Inventory Description	Client Count	Auditor Count	Difference
6531	15	1-42-003	back plate	125	125 (a)	0
8340	18	1-83-012	1/4″ copper plate	93	93 (a)	0
1483	24	2-11-004	Single end wire	1325 yds.	1321 yds. (a)	4 yds. (b)
4486	26	2-28-811	Copper tubing	220	220 (a)	0
3334	48	4-26-204	Side plate	424	424 (a)	0
8502	64	7-44-310	1/2″ copper wire	276 ft.	276 ft. (a)	0
8844	68	7-72-460	3/8″ copper wire	419 ft.	419 ft. (a)	0
6295	92	3-48-260	Front plate	96	69 (a)	27 (b)

(a) Traced to client's inventory summary sheet (F-4) noting corrections for all differences.
(b) Each difference was corrected by the client. The net effect of the corrections was to increase inventory by $840. If similar errors existed in the unsampled portion of the population (F-5), the projected misstatement would amount to $26,460, which is considered to be immaterial. Pass further investigation.

the extent of test counts and any material discrepancies resulting therefrom, and (3) conclusions on the accuracy of the counts and the general condition of the inventory.

Inventories Determined by Statistical Sampling

A company may have inventory controls or use methods of determining inventories, such as statistical sampling, that do not require an annual physical count of every item of inventory. Such methods do not relieve the auditor of the responsibility to observe the taking of inventories. It is still necessary to observe such counts as deemed necessary in the circumstances. In addition, the auditor must obtain evidence on the appropriateness of the method used to determine inventory quantities. When the client uses statistical sampling methods, AU 331.11 indicates that the auditor must ascertain that (1) the sampling plan has statistical validity, (2) it has been properly applied, and (3) the results in terms of precision and reliability are reasonable in the circumstances.

Observation of Beginning Inventories

To express an unqualified opinion on the income statement, the auditor must observe the taking of both the beginning and ending inventories. On a recurring audit engagement, this requirement is met by observing the ending inventory of each year. However, in the initial audit of an established company, the auditor may either be appointed after the beginning inventory has been taken or be asked to report on the financial statements of one or more prior periods. In such circumstances, it is impracticable and unreasonable for the auditor to have observed the inventory taking, and generally accepted auditing standards permit the auditor to verify the inventories by other auditing procedures.

When the client has been audited by another firm of independent auditors in the prior period(s), the other procedures may include a review of the predecessor auditor's report and/or working papers and a review of the client's inventory summaries for the prior period(s). If the client has not been audited previously, the auditor may be able to obtain audit satisfaction by reviewing the summaries of any client counts, testing prior inventory transactions, and applying gross profit tests to the inventories. Such procedures are appropriate only when the auditor is able to verify the validity and propriety of the ending inventory for the period under audit.

When inventories have been observed, the auditor may be able to issue a standard audit report. This is also permissible when the auditor has used alternative substantive tests to verify the beginning inventory. However, when sufficient evidence has not been obtained as to the beginning inventories or the auditor is unable to observe the taking of ending inventories, the auditor has a scope limitation and should issue a qualified opinion or a disclaimer of opinion as discussed in Chapter 2.

Test Clerical Accuracy of Inventory Listings

After the physical inventory has been taken, the client uses the inventory tags or count sheets to prepare or compile a listing or listings of all items counted. The inventory items are then priced to arrive at the total dollar valuation of the inventory on hand. Because this listing serves as the client's basis for any entries required to adjust recorded inventories to agree with those on hand, the auditor must perform certain tests to determine that the listing is clerically accurate and that it accurately represents the results of the physical counts.

Tests of clerical accuracy include recalculating the totals shown on the inventory listings and verifying the accuracy of the extensions of quantities times unit prices on a test basis. To determine that the list accurately represents the results of the count, the auditor traces his or her own test counts to the inventory listings, and vouches items on the listings to the inventory tags and count sheets used in the physical inventory. The physical counts are then compared on a test basis with amounts per perpetual records, when applicable, and any differences are noted, investigated, and traced to adjusting entries when required. This test provides evidence for the existence or occurrence, completeness, and valuation or allocation assertions.

Test Inventory Pricing

This test involves examining supporting documentation for both the cost and market value of inventories. Thus, it relates primarily to the valuation or allocation assertion. It also involves determining that the costing procedures used are consistent with those used in prior years. A review of perpetual inventory records and inquiry of the client should enable the auditor to determine both the basis and costing methods used in pricing inventory quantities. The consistency of the pricing, in turn, can be established by recourse to last year's working papers on a recurring audit and/or to the prior year's financial statements. This step in the verification of pricing includes a review of the pricing of obsolete and damaged goods to ascertain that they are not valued in excess of net realizable value at the statement date. Evidence in support of unit costs varies with the nature of the inventory. For items purchased for resale, use, or consumption (merchandise inventory, raw materials, and supplies), costs should be vouched to representative vendor invoices. If the client is unable to produce vendor invoices for the quantity in inventory, it would indicate a potential existence problem with inventories.

Test Cost of Manufactured Inventories

The nature and extent of the auditor's pricing tests of work in process and finished goods depend on the reliability of the client's cost accounting records and the methods used by the client in accumulating such costs. The auditor should review the methods for propriety as well as for accuracy and consistency of application. For example, when standard costs are used, the auditor should test the calculation of the standards, compare the calculations with engineering specifications, determine that the standards are current, and evaluate whether the standards approximate actual costs by examining the variance accounts. When variance accounts have large balances, the auditor must consider whether fair presentation requires a pro rata allocation to inventories and cost of goods sold, rather than simply charging the variances to cost of goods sold.

When client assertions about the nature of the inventory pertain to highly technical matters, the auditor may require the assistance of an outside expert. This might occur, for example, in an oil company with different grades of gasoline and motor oil, or in a jewelry store with different carat diamonds and different jeweled watches. As explained in Chapter 7, the auditor may use the work of a specialist as an auditing procedure to obtain competent evidential matter, when he or she is satisfied about the qualifications and independence of the expert.

Confirm Inventories at Locations Outside the Entity

When client inventories are stored in public warehouses or with other outside custodians, the auditor should obtain evidence as to the existence of the inventory by direct communication with the custodian. This type of evidence is deemed sufficient except when the amounts involved represent a significant proportion of current or total assets. When this is the case, AU 331.14, *Inventories,* states that the auditor should apply one or more of the following procedures:

- Test the owner's procedures for investigating the warehouseman and evaluating the warehouseman's performance.
- Obtain an independent accountant's report on the warehouseman's control procedures relevant to custody of goods and, if applicable, pledging of receipts, or apply alternative procedures at the warehouse to gain reasonable assurance that information received from the warehouseman is reliable.
- Observe physical counts of the goods, if practicable and reasonable.
- If warehouse receipts have been pledged as collateral, confirm with lenders pertinent details of the pledged receipts (on a test basis, if appropriate).

This test also provides evidence about the rights and obligations assertion. In addition, it will result in evidence as to the completeness assertion if the custodian confirms more goods on hand than stated in the confirmation request. Confirming inventories does not provide any evidence about the value of the inventory because the custodian is not asked to report on the cost, condition, or market value of the goods stored in the warehouse.

Examine Consignment Agreements and Contracts

Goods on hand may be held for customers, at their request, after a sale has occurred. Goods may also be held on consignment. Thus, management is requested to segregate goods not owned during the inventory taking. In addition, the auditor usually requests a written assertion on ownership of inventories in the client representation letter. This letter is illustrated in Chapter 19.

The auditor should also inquire of management as to any goods held on consignment. When consignments exist, the agreement should be examined for terms and conditions. If the client has shipped goods on consignment, the auditor should review the documentation to determine that goods held by the consignee are included in the consignor's inventory at the balance sheet date.

As to be expected, the evidence obtained from this test relates to the rights and obligations assertion. For goods held on consignment, the test also provides evidence concerning the presentation and disclosure assertion.

Tests of Details of Accounting Estimates

The audit of accounting estimates is particularly challenging because of their prospective nature. When auditing inventory, the auditor must determine whether it is appropriate to write down the value of inventory below cost because the inventory is obsolete or slow moving, and whether conditions would cause the client to sell inventory at such a price that it would experience a loss on its sale.

The auditor's responsibility for quality is limited to that of a reasonably informed observer. This means that the auditor is expected to determine whether the inventory appears to be in condition for sale, use, or consumption, and whether there are any obsolete, slow-moving, or damaged goods. The auditor obtains evidence of general condition or obsolescence by:

- Observing the client's inventory taking
- Scanning perpetual inventory records for slow-moving items
- Reviewing quality control production reports

In addition, the auditor will use hindsight to the extent possible and review the sale of inventory after year-end to determine the reasonableness of costs compared to subsequent sales prices. For example, the auditor will usually:

- Compare the cost of inventory items with the entity's current sales catalog and sale reports
- Review inventory turnover after year-end
- Consider whether a change in replacement costs is an indicator of changing market conditions
- Make inquiries of the client about slow-moving and obsolete inventory and the realizable value of inventory through sales

When the evidence suggests a decline in the realizable value of the goods, an appropriate write-down below cost is required by GAAP.

Comparison of Statement Presentation with GAAP

It is customary to identify the major inventory categories in the balance sheet and the cost of goods sold in the income statement. In addition, there should be disclosure of the inventory costing method(s) used, the assignment or pledging of inventories, and the existence of major purchase commitments.

Evidence pertaining to statement presentation and disclosure is usually provided by the substantive tests described above. Further evidence may be obtained, as needed, from a review of the minutes of board of directors' meetings and from inquiries of management. Based on the evidence and a comparison of the client's financial statements with applicable accounting pronouncements, the auditor determines the propriety of the presentation and disclosures.

Inquiry of management is also used to determine the existence of binding contracts for future purchases of goods. When such commitments exist, the auditor should examine the terms of the contracts and evaluate the propriety of the company's accounting and reporting. When material losses exist on purchase commitments, they should be recognized in the statements, together with a disclosure of the attendant circumstances as noted in the discussion of accounts payable in the previous chapter.

Based on the evidence obtained from some combination of the foregoing substantive tests, the auditor should be able to satisfy each of the audit objectives for inventories.

[LEARNING CHECK

16-8 What factors should be considered by an auditor in specifying the acceptable level of detection risk for assertions pertaining to (a) merchandise inventory and (b) manufactured finished goods inventory?

16-9 Indicate several ratios and their formulas that may be used in applying analytical procedures to inventory balances.

16-10 a. Identify five tests of details of balances that may be applied to inventories.
b. For the test of observing the client's physical inventory count, indicate (1) when this test is required, (2) factors that affect the timing and extent of the test, (3) what should be considered in evaluating the client's inventory-taking plans, and (4) what the auditor should do during the actual taking of the physical inventory.

16-11 a. What documents and other information does the auditor use in performing an inventory pricing test?
b. How are confirmations used in the audit of inventory balances?

16-12 a. Explain the nature of the assertion being tested when the auditor evaluates the net realizable value of inventory.
b. Identify the audit procedures that an auditor would perform to evaluate the net realizable value of inventory.

[AUDITING THE PERSONNEL SERVICES CYCLE]

An entity's **personnel services cycle** involves the events and activities that pertain to executive and employee compensation. The types of compensation include

Audit Decision 6

■ What is the nature of the personnel services cycle, and how are specific audit objectives developed for the personnel services cycle?

salaries, hourly and incentive (piecework) wages, commissions, bonuses, stock options, and employee benefits (e.g., health insurance and paid vacations). The major class of transactions in this cycle is **payroll transactions.** Accounts affected by these transactions are shown in Figure 16-10. In many companies, payroll is recorded when paid, and payroll taxes are accrued at the same time. If the pay period does not match up with the end of the quarter or fiscal year, accruals should be made for payroll payable.

The personnel services cycle interfaces with two other cycles. The paying of the payroll and the payment of payroll taxes relate to cash disbursements transactions in the expenditure cycle. The audit of the imprest payroll bank account used for payroll disbursements is covered in Chapter 18. The distribution of factory labor costs to work in process pertains to the production cycle. The remainder of this section focuses primarily on hourly compensation to employees and related payroll taxes, and on important measurement and disclosure issues related to stock options and pension plans.

AUDIT OBJECTIVES

Selected specific audit objectives for the personnel services cycle are shown in Figure 16-11. The procedures used by the auditor to meet these objectives are described in the remainder of this chapter.

UNDERSTANDING THE ENTITY AND ITS ENVIRONMENT

Audit Decision 7

■ What audit planning decisions should be made when developing an audit program for the personnel services cycle?

Detailed statistics on labor costs by industry are not as readily available as other financial statistics without belonging to a specific trade association. However, some industries, such as the school district, are labor intensive. The audit of personnel services may represent 80 to 90 percent of the total annual budget for a school district. The hotel industry is a service industry that also depends on effective utilization of personnel. Today, the majority of employment in the U.S. economy is in the service sector.

Personnel services may be of varying importance to manufacturers, wholesalers, and retailers. Some industries may differ widely on the labor intensiveness of the manufacturing process. Furthermore, some manufacturers continue to have defined benefit pension plans that have significant inherent risks associated with

Figure 16-10 ■ Key Transactions in the Personnel Services Cycle

Debit	Credit
Compensation expense (including salaries, wages, commissions, bonuses, stock options and stock appreciation rights, and employee benefits)	Imprest payroll bank account (for net payroll)
Direct labor costs	Accrued benefits payable
Manufacturing labor (indirect labor costs)	Liabilities for amounts withheld from employees
Payroll tax expense	Accrued payroll taxes payable

Figure 16-11 ■ Selected Specific Audit Objectives for the Personnel Services Cycle

Specific Audit Objectives

Transaction Objectives

Occurrence. Recorded employee compensation, benefits, and payroll tax expenses relate to compensation for services rendered during the year **(EO1).**

Completeness. Recorded employee compensation, benefits, and tax expenses include all such expenses incurred for personnel services during the year **(C1).**

Accuracy. Employee compensation, benefits, and payroll tax expenses are accurately computed and recorded **(VA1).**

Cutoff. Employee compensation, benefits, and payroll tax expenses have been recorded in the correct accounting period **(EO1 and C1).**

Classification. Employee compensation, benefits, and payroll tax expenses are properly identified and classified in the income statement **(PD1).**

Balance Objectives

Existence. Employee compensation, benefits, and payroll tax liabilities represent amounts owed at the balance sheet date **(EO2).**

Completeness. Employee compensation, benefits, and payroll tax liabilities include all such amounts owed at the balance sheet date **(C2).**

Rights and Obligations. Employee compensation, benefits, and payroll tax liabilities are obligations of the reporting entity **(RO1).**

Valuation or Allocation. Employee compensation, benefits, and payroll tax liabilities are accurately computed and recorded **(VA2).**

Disclosure Objectives

Occurrence and Rights and Obligations. Disclosed employee compensation and benefits transactions and balance have occurred and pertain to the entity **(PD3).**

Completeness. All employee compensation and benefits disclosures that should have been included in the financial statements have been included **(PD4).**

Classification and Understandability. All employee compensation and benefits information is appropriately presented and described and information in disclosures is clearly expressed **(PD5).**

Accuracy and Valuation. All employee compensation and benefits information is disclosed accurately and at appropriate amounts **(PD6).**

the measurement of pension costs and pension disclosures. Other compensation plans may include stock options that present their own measurement and disclosure risks for auditors. Before proceeding with the audit of personnel services, it is important for the auditor to understand:

- The importance of personnel services to the overall entity (e.g., is the entity labor intensive or capital intensive?).
- The nature of compensation, as hourly compensation requires a different control system than salaried compensation.
- The importance of various compensation packages such as bonuses, stock options and stock appreciation rights, and pension agreements.

If an entity's compensation is primarily salary based and demonstrates a predictable relationship to the delivery of services, the auditor might emphasize analytical procedures in the development of audit strategy. If compensation expenses are based on hourly pay, and show a high degree of variability throughout the period, the auditor may emphasize a lower assessed level of control risk approach.

ANALYTICAL PROCEDURES

The auditor usually will perform analytical procedures early in the audit of the personnel services cycle because they are cost effective. Examples of analytical procedures that the auditor might use are presented in Figure 16-12. Analytical procedures may be useful in identifying potential fraud such as when gross payroll per employee exceeds the auditor's expectations. This type of procedure is most effective when the auditor is able to use generalized audit software, sort employees by category, and then evaluate the average pay by category of employees. For example, if the auditor was performing this test for a professional baseball team, professional ballplayers should be segregated from front office personnel, which in turn is segregated from employees who vend hot dogs at the ball games. If every class of employees is lumped together, the analytical procedure quickly becomes ineffective.

In some cases, the auditor may be able to develop accurate expectations regarding an organization's payroll. In a university, for example, the auditor may be able to develop accurate estimates of the number of full-time faculty and gross pay for those faculty in a school or college given the number of full-time-equivalent students. As the auditor is able to develop more reliable expectations, he or she may place more assurance on that evidence and assess analytical procedures risk at a lower level than if expectations were rather broad and general. As stated above, the use of generalized audit software may allow for the development of more accurate expectations when auditing the personnel services cycle.

INHERENT RISK

The auditor is rarely concerned about the completeness assertion in the payroll cycle because most employees quickly follow up with their employers if they are not paid. However, payroll fraud (existence or occurrence) is a major concern for the auditor. Fraud may occur at two levels. Employees involved in preparing and paying the payroll may process data for fictitious employees and then divert the paychecks to their own use. When there is frequent turnover of personnel in a company, there is the risk that a terminated employee is continued on the payroll. Alternatively, management may overtly misclassify or "pad" labor cost in government contract work to defraud the agency.

Pay periods may be weekly, bimonthly, or monthly. In each case, the volume of payroll transactions may be high. For factory workers, gross earnings may be based on time and/or productivity. Thus, the computations may be complex, and inherent risk for the valuation or allocation assertion may be high. Significant valuation issues also exist in accounting for stock options and for defined benefit pension plans.

Finally, a company's benefit plans might involve stock options, stock appreciation rights, or pension plans that involve both significant measurement and disclosures issues. Hence, inherent risk may be high for the existence or occurrence, valuation or allocation, and presentation and disclosure assertions.

Figure 16-12 ■ Analytical Procedures Commonly Used to Audit the Personnel Services Cycle

Ratio	Formula	Audit Significance
Average payroll cost per employee classification	Total payroll costs for an employee group divided by the number of employees in the group	Reasonableness test of gross payroll for a group of employees. Many companies have more than one class of employee, and it is important to evaluate the reasonableness of payroll based on employee class.
Revenue per employee	Total revenue ÷ the number of full-time employees	This may be a measure of productivity per employee. This is particularly important in services industries and would be compared with industry statistics.
Total payroll costs as a percentage of revenues	Total payroll expenses ÷ total revenues	Reasonableness test of payroll costs. This is often compared with industry statistics.
Payroll tax expense as a percentage of gross payroll	Total payroll tax expenses ÷ gross payroll	Reasonableness test of payroll taxes. This can often be compared with standard tax rates.
Compare payroll expenses (salaries and wages, commissions, bonuses, employee benefits, etc.) with prior-year expenses or budgets	Current-year payroll expenses ÷ prior-year payroll expenses	Reasonableness test for payroll expenses if the ratio is significantly different from 1.0
Compare current year payroll liability with prior-year payroll liability	Current-year payroll tax liability ÷ prior-year payroll tax liability adjusted for growth in payroll volume	Reasonableness test for payroll liability if the ratio is significantly different from 1.0
Compute ratio of payroll tax expense to total payroll expenses	Payroll tax expense ÷ total payroll expense	Reasonableness test for payroll tax expense based on prior-year ratio of payroll tax expense to total payroll.
Employee benefits expenses as a percentage of gross payroll	Total benefits expenses ÷ gross payroll	Reasonableness test of benefits expenses. This is often compared with industry statistics.

CONSIDERATION OF INTERNAL CONTROLS

Audit Decision 8

■ What should be considered in evaluating control activities for personnel services cycle transactions?

As for other major transaction cycles, all five components of internal controls are relevant to the personnel services cycle. Several control environment factors have direct relevance. Overall responsibility for personnel matters is often assigned to a vice president of industrial or labor relations, or a manager of human or personnel resources. The human resources department is usually responsible for authorizing employment of personnel and for authorizing salaries, wages, and benefits. The board of directors usually sets officers' salaries and other forms of officer compensation. Departments that may be significantly involved in the processing of payroll transactions include timekeeping, payroll, and the treasurer's office. Personnel polices and practices should ensure that individuals involved in payroll functions are knowledgeable about state and federal payroll laws and regulations and applicable provisions of labor contracts. Finally, a sound control environment establishes an appropriate level of accountability for the use of the entity's personnel resources.

In addition to a strong control environment, at this stage we assume that the entity has sound risk assessment procedures and effective monitoring of the system of internal control. The following discussion focuses on the accounting system aspects of the information and communication component, and on effective control activities. The discussion further assumes that an entity has good segregation of duties and that computer general controls are effective, so that the focus of the discussion is on programmed application control procedures.

Common Documents and Records

The following documents and records are important in executing and recording payroll transactions:

- **Personnel authorization.** Memo issued by personnel department indicating the hiring of an employee and each subsequent change in the employee's status for payroll purposes.
- **Clock card.** Form used by each employee to record hours worked daily during a pay period. It is used with time clocks that record the time on the card. This and the following form may be replaced in modern systems with an employee badge that is inserted into a terminal to cause an electronic record of the time to be made.
- **Time ticket.** Form used to record time worked by an employee on specific jobs. Time worked is often machine imprinted.
- **Payroll register.** Report showing each employee's name, gross earnings, payroll deductions, and net pay for a pay period. It provides the basis for paying employees and recording the payroll.
- **Imprest payroll bank account.** Account to which a deposit equal to the total net payroll is made each pay period, and on which checks for salaries and wages for employees are drawn.
- **Payroll check.** Order drawn on a bank to pay an employee. It is accompanied by a detachable memo indicating gross earnings and payroll deductions.
- **Labor cost distribution summary.** Report showing the account classifications for gross factory earnings for each pay period.
- **Payroll tax returns.** Forms prescribed by tax authorities for filing with payments of taxes withheld from employees, and employer's payroll taxes for social security and federal and state unemployment.
- **Employee personnel file.** Holds pertinent employment data for each employee and contains all personnel authorizations issued for the employee, job evaluations, and disciplinary actions, if any.
- **Personnel data master file.** Computer file containing current data on employees needed for calculating payroll such as job classification, wage rate, and deductions.
- **Employee earnings master file.** Computer file containing each employee's gross earnings, payroll deductions, and net pay for the year to date by pay periods.

Functions and Related Controls

The processing of payroll transactions involves the following **payroll functions:**

- Initiating payroll transactions, including:
  - Hiring employees
  - Authorizing payroll changes
- Receipt of services, including preparing attendance and timekeeping data
- Recording and paying payroll transactions, including:
  - Preparing and recording the payroll
  - Paying the payroll and protecting unclaimed wages
  - Filing payroll tax returns

Each function is explained below. Where applicable, reference is made to the flowchart in Figure 16-13, which shows a representative system for processing payroll transactions. In this case, the company is using on-line entry/on-line processing for payroll authorization changes, and batch entry/batch processing for preparing the payroll. Figure 16-14 provides sample control procedures related to the functions discussed below.

In the flowchart, it should be observed that responsibility for executing and recording payroll is spread over several departments. This segregation of duties contributes significantly to reducing the risk of payments to fictitious employees or excessive payments to actual employees due to inflated rates or hours.

Initiating Payroll Transactions

Hiring Employees

The hiring of employees is done in the personnel department. All hirings should be documented on a personnel authorization form. The form should indicate the job classification, starting wage rate, and authorized payroll deductions. In the system shown in Figure 16-13, authorized individuals in the personnel department gain access to the personnel data master file by entering a password on an on-line terminal before entering data on new hires. Periodically, a computer-generated log of all changes to the master file is printed and independently checked by a personnel manager not involved in entering the data into the computer. One copy of the personnel authorization form is placed in the employee's personnel file in the personnel department.

Controls over adding new hires to the personnel data master file reduce the risk of payroll payments to fictitious employees. Thus, they relate to existence or occurrence and rights and obligations assertions for payroll transactions.

Authorizing Payroll Changes

The request for a change in job classification or a wage rate increase may be initiated by the employee's supervisor. However, all changes should be authorized in writing by the personnel department before being entered in the personnel data master file. Other controls over entering the changes in the computer and distributing the change forms are the same as those discussed above for new hires. These controls over payroll changes help to ensure the accuracy of the payroll and relate to the valuation or allocation assertion as well as rights and obligations.