

## Ch 1 - Defining Costs and Cost Analysis

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### 1.0 Introduction

This chapter describes contract costs and cost analysis.

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### 1.1 Defining Contract Costs

*Contract Costs.* Contract costs are monetary measures of the capital and labor required to complete a contract. Not all contract costs result from cash expenditures during the contract period. The following table presents the three most common ways costs are incurred:

<b>Contract Cost Source</b>	<b>Example</b>
<b>Cash expenditure</b> -the actual outlay or dollars in exchange for goods or services.	The payment by cash, check, or electronic funds transfer to a vendor for raw materials.
<b>Expense accrual</b> -expenses are recorded for accounting purposes when the obligation is incurred, regardless of when cash is paid out for the goods or services.	The incurring of an obligation in the current year to pay an employee a retirement pension at some point in the future.
<b>Draw down of inventory</b> -the use of goods purchased and held in stock for production and/or direct sale to customers; refers to both the number of units and the dollar amount of items drawn out.	Electronic components purchased in large volume against anticipated total demand and held in inventory until drawn out to fill a specific order. While the components were paid for in the past, the drawing out of a component

	to meet a contract need results in a cost being charged to the contract.
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The total cost of a contract is the sum of the direct and indirect costs allocable to the contract, incurred or to be incurred, less any allocable credits, plus any applicable cost of money.

A direct contract cost is any cost that can be identified specifically with a final cost objective (e.g., a particular contract).

- Costs identified specifically with a particular contract are direct costs of the contract and are charged to that contract.
- Costs must not be charged to a contract as direct costs if other costs incurred for the same purpose in like circumstances have been charged as indirect costs to that contract or any other contract.
- All costs specifically identified with other contracts are direct costs for those contracts and shall not be charged to another contract directly or indirectly.

**For example:** The cost of 5,000 pounds of sheet metal used to fabricate covers for equipment built under a Government contract, would be charged directly to that contract and no other contract.

*Indirect Cost* ([FAR 31.203](#)). An indirect cost is any cost NOT directly identified with a single final cost objective, but identified with two or more final cost objectives or an intermediate cost objective.

- After the contractor has charged all direct costs to contracts (or other final cost objectives), indirect costs are those remaining to be allocated to the various cost objectives.
- The distribution of indirect costs among various contracts should be based on the benefit accrued. If the contract did not benefit, it should not share the indirect cost.
- Costs must not be charged to a contract as indirect costs if other costs incurred for the same purpose in like circumstances have been charged as direct costs to that contract or any other contract.

**For example:** A contractor is simultaneously working on two contracts in the same rented building. The rent for that building should be allocated to those two contracts as an indirect cost. If one contract used 60 percent of the building, it should be allocated about 60 percent of the rent expense. Other contracts that do not benefit from the use of the building should not be allocated any rent expense for the building.

*Alternative Direct Cost Treatment* ([FAR 31.202\(b\)](#)). For reasons of practicality, any **direct cost of minor dollar amount** may be treated as an indirect cost if the accounting treatment:

- Is consistently applied to all final cost objectives, and
- Produces substantially the same results as treating the cost as a direct cost.

**For example:** The cost of inexpensive rivets used to fabricate equipment would be a direct cost. However, the cost of tracking each rivet to each unit of equipment could be more than the cost of the rivets themselves. It might be more practical to treat the cost of these rivets as an indirect cost and allocate that cost to all items that use those rivets. Remember this method may only be used if it is consistently applied to all cost objectives and produces substantially the same results as treating the rivet cost as a direct cost.

*Direct/Indirect Cost Decision* ([FAR 31.201](#), [31.202](#), and [31.203](#)). The decision to classify a cost as direct or indirect is not always a clear choice. There is no absolute list of costs that must be treated as direct costs or indirect costs. Contractors have the right and responsibility to define costs within their own accounting systems. At the same time, the Government prescribes guidelines for use by contractors in making their decisions and for use by you in reviewing the appropriateness of their decisions. Three sources of guidance are particularly important.

- Cost Accounting Standards (CAS) are issued by the Cost Accounting Standards Board (CASB). When these standards are applicable, they take priority over other forms of accounting guidance.

- The Federal Acquisition Regulation (FAR) provides both general and specific guidelines on accounting for costs.
- Generally Accepted Accounting Principles (GAAP) are general rules used by all business entities. They are non-regulatory guidance developed and used by Certified Public Accountants. However, they provide the general guidelines followed by all firms in accounting system development.

The role of Government representatives-be they auditors, analysts, or contracting officers-is not so much directing or approving the direct/indirect cost decision as it is reviewing the adequacy and acceptability of contractor's accounting systems for use in Government contracting.

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## 1.2 Identifying Key Cost Analysis Considerations

*Definition of Cost Analysis* ([FAR 15.404-1\(c\)\(1\)](#)). Cost analysis is:

- The:
  - Review and evaluation of the separate cost elements and profit/fee in an offeror's or contractor's proposal (including cost or pricing data or information other than cost or pricing data), and
  - Application of judgment;
- Used to determine how well the proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency.

*Required Cost Analysis* ([FAR 15.404-1\(a\)\(3\)](#)). You must use cost analysis to evaluate the reasonableness of cost elements when cost or pricing data are required.

*Optional Cost Analysis* ([FAR 15.404-1\(a\)\(4\)](#)). You may also use cost analysis to evaluate information other than cost or pricing data to determine cost reasonableness or cost realism.

*Cost Reasonableness* ([FAR 31.201-3](#)). A cost is reasonable if, in its nature and amount, it does not exceed the cost

which would be incurred by a prudent person in the conduct of competitive business.

*Cost Realism* (FAR 15.401). To be realistic, the costs in an offeror's proposal must be:

- Realistic for the work to be performed under the contract;
- Reflect a clear understanding of contract requirements; and
- Consistent with the various elements of the offeror's technical proposal.

*Cost Analysis Supports Price Analysis* ([FAR 15.404-1\(a\)\(3\)](#)). Perform price analysis even when you perform cost analysis. Assuring the reasonableness of individual elements of cost does not always assure overall price reasonableness.

**For example,** suppose that you wanted to procure a custom-made automobile identical to a Pontiac Trans Am. At your request, your neighborhood mechanic agrees to build you such a car. In building the car, the mechanic gets competitive quotes on all the necessary parts and tooling, pays laborers only the minimum wage, and asks only a very small profit.

How do you think the final price will compare to a car off an assembly line? Probably at least ten times more expensive. Parts alone may be five times more expensive. The entire cost of tooling will be charged to one car. Labor, although cheaper per hour, will likely not be as efficient as assembly-line labor. Is the price reasonable? That decision can only be made using a thorough price analysis.

*Cost Analysis Techniques and Procedures* ([FAR 15.404-1\(a\)\(3\)](#)). As appropriate, use the following techniques and procedures to perform cost analysis:

- Verify cost or pricing data or information other than cost or pricing data.
- Evaluate cost elements, including:
  - The necessity for and reasonableness of proposed costs, including allowances for contingencies;
  - Projections of the offeror's cost trends, on the basis of current and historical cost or pricing

- data or information other than cost or pricing data;
  - o A technical appraisal of the estimated labor, material, tooling, and facilities requirements, and scrap and spoilage factors; and
  - o The application of audited or negotiated indirect cost rates, labor rates, cost of money factors, and other factors.
  - Evaluate the effect of the offeror's current practices on future costs.
    - o Ensure that the effects of inefficient or uneconomical past practices are not projected into the future.
    - o In pricing production of recently developed complex equipment, perform a trend analysis of basic labor and materials even in periods of relative price stability.
  - Compare costs proposed by the offeror for individual cost elements with:
    - o Actual costs previously incurred by the offeror;
    - o Previous cost estimates from the offeror or from other offerors for the same or similar items;
    - o Other cost estimates received in response to the Government's request;
    - o Independent Government cost estimates by technical personnel; and
    - o Forecasts or planned expenditures.
  - Verify that the offeror's cost submissions are in accordance with the contract cost principles and procedures in [FAR Part 31](#) and any applicable Cost Accounting Standards Board Cost Accounting Standards.
  - Determine whether any cost or pricing data necessary to make the contractor's proposal accurate, complete, and current have not been either submitted or identified in writing by the contractor. If there are such data:
    - o Attempt to obtain the data and negotiate using the data obtained, or
    - o Make satisfactory allowance for the incomplete data.
  - Analyze the results of any make-or-buy program reviews, in evaluating subcontract costs.
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### **1.3 Defining The Cost Estimating And Cost Accounting Relationship**

*Cost Estimating System* ([FAR 15.407-5](#), [DFARS 215.407-5-70\(a\)](#), [215.407-5-70\(d\)](#), and [252.215-7002](#)).

A contractor's cost estimating system is the policies, procedures, and practices for generating cost estimates and other data included in cost proposals submitted to customers in the expectation of receiving contract awards. It includes the contractor's:

- Organizational structure;
- Established lines of authority, duties, and responsibilities;
- Internal controls and managerial reviews;
- Flow of work, coordination, and communication; and
- Estimating methods, techniques, accumulation of historical costs, and other analyses used to generate cost estimates.

An acceptable estimating system should provide for the use of appropriate source data, utilize sound estimating techniques and good judgment, maintain a consistent approach, and adhere to established policies and procedures.

*Audit Review of Cost Estimating System* ([FAR 15.407-5](#)).

When appropriate, the cognizant auditor will establish and manage regular programs for reviewing selected contractors' estimating systems or methods, in order to:

- Reduce the scope of reviews to be performed on individual proposals;
- Expedite the negotiation process; and
- Increase the reliability of proposals.

For each estimating system review, the auditor will:

- Document review results in a survey report.
- Send a copy of the survey report and a copy of the official notice of corrective action required to each contracting office and contract administration office having substantial business with that contractor.
- Consider significant deficiencies not corrected by the contractor in subsequent proposal analyses and negotiations.

*Characteristics of an Acceptable Estimating System* ([DFARS 215.407-5-70\(d\)](#)). When evaluating the acceptability of a contractor's estimating system, consider whether it:

- Establishes clear responsibility for preparation, review and approval of cost estimates;
- Provides a written description of the organization and duties of the personnel responsible for preparing, reviewing, and approving cost estimates;
- Assures that relevant personnel have sufficient training, experience and guidance to perform estimating tasks in accordance with the contractor's established procedures;
- Identifies the sources of data and the estimating methods and rationale used in developing cost estimates;
- Provides for appropriate supervision throughout the estimating process;
- Provides for consistent application of estimating techniques;
- Provides for detection and timely correction of errors;
- Protects against cost duplication and omissions;
- Provides for the use of historical experience, including historical vendor pricing information, where appropriate;
- Requires use of appropriate analytical methods;
- Integrates information available from other management systems, where appropriate;
- Requires management review including verification that the company's estimating policies, procedures and practices comply with applicable regulations;
- Provides for internal review of and accountability for the adequacy of the estimating system, including the comparison of projected results to actual results and an analysis of any differences;
- Provides procedures to update cost estimates in a timely manner throughout the negotiation process; and
- Addresses responsibility for review and analysis of the reasonableness of subcontract prices.

*Indicators of Potentially Significant Estimating System Deficiencies* ([DFARS 215.407-5-70\(d\)](#)). Be on the lookout for conditions that may produce or lead to significant estimating deficiencies. This includes:



- Failure to ensure that historical experience is available to and utilized by cost estimators, where appropriate;
- Continuing failure to analyze material costs or failure to perform subcontractor cost reviews as required;
- Consistent absence of analytical support for significant proposed cost amounts;
- Excessive reliance on individual personal judgment where historical experience or commonly utilized standards are available;
- Recurring significant defective pricing findings within the same cost element(s);
- Failure to integrate relevant parts of other management systems (e.g., production control or cost accounting) with the estimating system so that the ability to generate reliable cost estimates is impaired; and
- Failure to provide established policies, procedures, and practices to persons responsible for preparing and supporting estimates.

*Cost Accounting System* ([DCAM 9.302a](#)). An effective cost estimating system integrates applicable information from a variety of company management systems. The accounting system is not the only source of such information, but it is the primary source.

A firm's accounting system consists of the methods and records established to identify, assemble, analyze, classify, record, and report the firm's transactions and to maintain accountability for the related assets and liabilities. The accounting system should be well-designed to provide reliable accounting data and prevent mistakes that would otherwise occur.

An inadequate cost accounting system can provide data that are not current, accurate, and complete data in support of an offeror's proposal. The defective cost data can create inaccurate estimates no matter how well the estimating uses the data provided.

*Characteristics of an Adequate Accounting System* ([DCAM 9.302b](#)). To provide the data required for cost estimating purposes, a firm's cost accounting system must contain sufficient refinements to provide (where applicable) cost segregation for:

- Preproduction work and special tooling;
- Prototypes, static test models, or mockups;
- Production by individual production centers, departments, or operations-as well as by components, lots, batches, runs or time periods;
- Engineering by major task;
- Each contract item to be separately priced;
- Scrap, rework, spoilage, excess material, and obsolete items resulting from engineering changes;
- Packaging and crating when substantial; and
- Other nonrecurring or other direct cost items requiring separate treatment.

*Two Common Cost Accounting Systems.* There are two commonly-used systems for cost accounting, job-order and process. Either system can provide adequate results, when it is properly maintained by the firm. However, system differences will affect the presentation of available information.

**Job-Order Cost System.** Under a job-order cost system the firm accounts for output by specifically identifiable physical units. The costs for each job or contract normally are accumulated under separate job orders.

- When a contract is for a limited number of units that are neither very complex nor costly, the costs of all units may be accumulated under one job order without any further breakdown.
- When the contract is for items that are both complex and costly, the total quantity may be broken down into smaller production lots. The job order for the total contract may be supported by a separate job order for each lot.
  - The use of lots permits the contractor to establish better control over the work, and the historical cost data from a series of lots lend themselves to a projection of estimated costs for future production.
  - Experience with the product normally determines the number of units for which costs are to be accumulated.

**For example:** A contract for 100 units of an item that has never been produced may have 10 separate lots under the job order. Four years and thousands of units later, the costs

for a quantity of 100 units may be accumulated under the contract job order without any further breakdown by lot.

- Because the physical units of production under a job-order cost system are identified with specific job orders and lots, the labor distribution and accumulation system used by the contractor will identify the direct factory labor cost associated with the units produced under such job-orders and lots. Supporting data will identify:
  - All persons who worked on the items produced, how much time they expended, and their rates of pay.
  - Total labor cost with subtotals and breakdowns by types of labor.

**Process Cost Systems.** Under a process cost system, direct costs are charged to a process even though end-items (which may not be identical) for more than one contract are being run through the process at the same time. At the end of the accounting period, the costs incurred for that process are assigned to the units completed during the period and to the incomplete units still in process.

- Process cost systems are typically used by firms that continuously manufacture a particular end-item, like automobiles or chemicals which require identical or highly similar production processes. A process is one part of a complete set of activities that an item must pass through during manufacture.
  - The completed item results from a series of processes, each of which produces some changes in the item.
  - The number of processes involved will vary with the complexity of the item.
  - The greater the similarity between two end-items, the more likely they are to go through the same process, during the same period of time, with factory laborers devoting a part of their time to each item.
- A number of different methods may be used to assign costs to end items.
  - If all items being processed are identical, the contractor may add the costs incurred during the accounting period to the cost of the beginning work-in-process inventory and subtract the estimated cost of the ending work-in-process inventory to arrive at the total costs of items

completed. Unit cost is determined by dividing the total cost by the number of units completed.

- If all items being processed are not identical, the contractor may use standard costs and, at the end of the accounting period, multiply the standard cost for each item by the number of units completed to arrive at a total cost. Variance from standard can be accounted for and assigned to end-items in a number of different ways.
  - Normally an item will go through more than one process. When an item comes out of one process and enters another, its cost from the process just completed will be charged to the next process, usually as material cost. This continues until the completed end-item emerges from its last process.
  - A process cost system identifies which factory employees charged their time to which processes, what their rates of pay were, and the total cost charged to the process.
    - Unlike a job-order cost system, you cannot determine the actual labor cost for specific end-items that have gone through a process, because cost elements lose their identity when they are charged to the next process as material costs.
    - You can generally add standard cost and a factor for variances and arrive at an acceptably close approximation of actual labor cost.
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#### 1.4 Describing Cost Estimating Methods

*Principles For Method Selection* ([FAR 31.201-1](#) and [DCAM 9-303b](#)). An offeror may use any generally accepted estimating method that is equitable and consistently applied.

<b>An estimating method is...</b>	<b>When...</b>
Equitable	It produces fair and reasonable results for all contracts and all customers of the firm. No individual or group of contracts or customers benefits at the expense of others.

Consistently applied	<p>It is applied in similar estimating situations for all contracts and all customers of the firm. However, different estimating methods may be applied in different estimating situations. Differences may be related to such factors as:</p> <ul style="list-style-type: none"> <li>• The relative dollar value of the estimate;</li> <li>• The firm's competitive position;</li> <li>• The definition of contract requirements; or</li> <li>• The availability of cost information applicable to the same or a similar product/service.</li> </ul>
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*Basic Cost Estimating Methods* ([DCAM 9-303d](#)). There are a variety of techniques that can be used to estimate contract cost. Some estimating texts identify ten or more. However, the most common classification identifies three methods: round-table, comparison, and detailed.

<b>Estimating Method</b>	<b>Explanation</b>
Round-Table	<p>Experts are brought together to develop cost estimates, by exchanging views and making judgments based on knowledge and experience.</p> <p>Most commonly used when there is little or no cost experience or detailed product information (e.g., specifications, drawings, or bills of material).</p>
Comparison	<p>Under this method, costs for a new item are estimated using comparisons with the cost of completing similar tasks under past or current contracts. Any differences are isolated and cost elements applicable to the differences are deleted from or</p>

	<p>added to experienced costs. Comparisons may be made at the cost element level or total price level. Adjustments may also be made for possible upward or downward cost trends.</p> <p>Most commonly used when specifications for the item being estimated are similar to other items already produced or currently in production and for which actual cost experience is available.</p>
Detailed	<p>This method is characterized by a thorough review of all components, processes, and assemblies. It requires detailed information to arrive at estimated costs and typically uses cost data derived from the accounting system, adjunct statistical records, and other sources.</p> <p>Most commonly used when the required information is available and future production potential warrants the cost of the detailed analysis required. It is the most accurate of the three methods for estimating direct cost. It is also the most time consuming and expensive.</p>

*Estimating Method Comparison (DCAM 9-303d).* The following table compares the three methods of cost estimating:

	Estimating Method		
	Round Table	Comparison*	Detailed
<b>Relative Accuracy</b>	<b>Low</b> -- because limited data are used	<b>Moderate/High</b> --depending on data, technique, and estimator	<b>High</b> -- based on engineering principles
<b>Relative Estimator Consistency</b>	<b>Low</b> -- different experts make different judgments	<b>Moderate/High</b> --depending on data, technique, and estimator	<b>High</b> -- based on uniform principle application
<b>Relative Development Speed</b>	<b>Fast</b> -- little detailed analysis	<b>Moderately Fast</b> -- especially	<b>Slow</b> -- requires detailed

	required	with repetitive use	design and analysis
<b>Relative Estimate Development Cost</b>	<b>Low</b> -- fast development and limited data requirements allow low development cost	<b>Moderate</b> -- depending on the need for data collection and analysis	<b>High</b> -- detailed work design and analysis require time and increase cost
<b>Relative Data Requirements</b>	<b>Low</b> -- based on expert judgment	<b>Moderate</b> -- only requires historical data	<b>High</b> -- requires detailed work design and analysis

\* Warning: This estimating method can project continuation of nonrecurring costs and cost inefficiencies experienced in past work.

*Combination Estimates.* There is no one estimating method that is best in all situations. In fact, most cost proposals will include different estimates made using different methods. All three methods may be used in the same proposal. Different methods may even be used as a cross-check in estimating a single cost element.

**For example:** For a unique research and development contract, an offeror may use round-table estimates for many cost elements because similar research has never been conducted before. However, the offeror may also use comparison estimates for other cost elements based on the costs incurred under other research and development contracts.

*Estimating Methods for Cost Analysis.* Whenever you perform a cost analysis, you should always consider the strengths and weaknesses of the estimating method used by the offeror in preparing the proposal. Remember, that when you are preparing your negotiation objective, you are not limited to using the method used by the offeror in developing proposal. You can use any method that appears appropriate under the circumstances.

<b>Estimating Method</b>	<b>Key Strengths and Weaknesses</b>
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Round-Table	<p><b>Strength:</b> Can be used with limited data.</p> <p><b>Weakness:</b> Lack of data increases variability between estimators and true costs.</p>
Comparison	<p><b>Strength:</b> Rapid development of estimates based on historical costs.</p> <p><b>Weakness:</b> Estimates based on historical costs can project historical inefficiencies.</p>
Detailed	<p><b>Strength:</b> Most accurate estimates.</p> <p><b>Weakness:</b> Requires complete information that may be expensive or impossible to obtain.</p>