BACK TO BASICS: As The Pendulum Shifts To More Fixed Price Contracts, Be Prepared For More Contract Changes and Know How To Price Them

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We have begun to see the Federal government's preference shift to the use of fixed price contracts for its procurements.[1] As this shift occurs, it is important to remember how fixed-price and cost-reimbursement contracts are defined and discussed in the Federal Acquisition Regulation ("FAR"):

> A firm-fixed-price contract provides for a price that is not subject to any adjustment on the basis of the contractor's cost experience in performing the contract. This contract type places upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss. It provides maximum incentive for the contractor to control costs and perform effectively and imposes a minimum administrative burden upon the contracting parties.[2]
>
> Cost-reimbursement types of contracts provide for payment of allowable incurred costs, to the extent prescribed in the contract. These contracts establish an estimate of total cost for the purpose of obligating funds and establishing a ceiling that the contractor may not exceed (except at its own risk) without the approval of the contracting officer.[3]

In its instructions regarding the circumstances under which to use a fixed-price contract, the FAR provides that:

> A firm-fixed-price contract is suitable for acquiring commercial items (see Parts 2 and 12) or for acquiring other supplies or services on the basis of reasonably definite functional or detailed specifications (see Part 11) when the contracting officer can establish fair and reasonable prices at the outset . . .[4]

Along with this shift to the use of fixed price contracts to buy products and services, the authors expect to see a rise in the need to identify changes in contract work scope, to measure the cost of the changes, and to submit change orders (or requests for equitable adjustments "REAs" or claims) for reimbursement.

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[1] See reference to Obama memorandum from March 2009 on Government Contracting.
[2] FAR Part 16.202 -- Firm-Fixed-Price Contracts.
[3] FAR Subpart 16.3 -- Cost-Reimbursement Contracts, 16.301 – General, 16.301-1 -- Description.
[4] FAR 16.202 -- Firm-Fixed-Price Contracts, 16.202-2 -- Application. This point is further emphasized in the FAR instructions to Contracting Officers regarding Negotiating Contract Type at FAR 16.103:

> (a) . . . The objective is to negotiate a contract type and price (or estimated cost and fee) that will result in reasonable contractor risk and provide the contractor with the greatest incentive for efficient and economical performance.
> (b) A firm-fixed-price contract, which best utilizes the basic profit motive of business enterprise, shall be used when the risk involved is minimal or can be predicted with an acceptable degree of certainty. However, when a reasonable basis for firm pricing does not exist, other contract types should be considered, and negotiations should be directed toward selecting a contract type (or combination of types) that will appropriately tie profit to contractor performance.

As the entity responsible for performing all contract audits for the United States Department of Defense ("DoD"), and providing accounting and financial advisory services regarding contracts and subcontracts to all DoD Components responsible for procurement and contract administration, the Defense Contract Audit Agency ("DCAA") will likely play an increasingly important role in connection with the negotiation, administration, and settlement of contracts as well as subcontracts and changes to those. In addition, the DCAA has historically performed audits for many government agencies in addition to the DoD.

This paper addresses some of the important, basic principles contractors should be mindful of as they identify contract work scope changes and select approaches to measure the impact of the changes.

When a contractor submits an REA in response to a government-directed or constructive change, the contractor must determine the price of the change and prove that the requested adjustment reasonably reflects the costs for which the government is responsible. In addition, the contractor must determine how such elements as direct labor, materials, subcontracts, indirect costs, and profit factor into the changed contract price. Also, in order to recover additional costs and profit, or to receive more time to complete the work, the contractor must prove to the customer – or a Board of Contract Appeals ("BCA") or court – that the cause of the change was related to the specific alleged events and problems. One of the first steps that a contractor must take when pricing a change is selecting a method of calculating the cost of the changed work. (For the purposes of this paper, *changed work* is defined to include formal and informal changes, suspensions, delays, disruptions, and some breaches of contract.) Also, the contractor must be prepared to document and support the rationale and methods applied in particular situations.[5]

Basic Changed Work Pricing Approaches

Changed-work pricing approaches that most closely link increased costs to specific changes are generally the most successful in terms of amount of change value recovered. Contracting Officers ("COs"), as well as higher-tier company purchasing officers, generally prefer well-documented, specific evidence supporting increases to contract prices. It is easier and at times, quicker, to evaluate these changes, and the likelihood of disputes is reduced with respect to audits performed by DCAA auditors, when a change has been well documented and reasonably measured. Less-specific approaches to the calculation of increased costs are disfavored and generally result in lower rates of recovery. Three of the more basic changed-work pricing methods are discussed below.

[5] In the area of pricing changed work, it is the authors' experience that it is particularly appropriate to seek the advice of counsel.

Detailed Cost-Buildup Approach

The detailed cost-buildup pricing approach is an item-by-item analysis of the resulting cost growth and schedule impact. It is an attempt to measure a specific change's cost impact on the contractor. The objective of this method is to determine, on the basis of historical cost data and appropriately supported estimates, the cost of performing the changed work.

Ideally, the equitable price adjustment is based on specifically identified costs which have been recorded in unique charge codes/accounts established to capture such changed work. However, because it is often difficult to identify and capture the costs of changed work until after it has occurred and because of incomplete accumulation and documentation of the costs arising from a change, a series of estimates is often required to supplement the available, contemporaneous project records. These estimated costs (e.g., hours, quantities, and indirect amounts) are priced from historical data that detail previous contract performance experiences. The advantages of the detailed cost-buildup approach include the following:

- It better defines the cause-and-effect relationships between the changed work and the increased cost of performance;
- It precludes the inclusion of contractor-responsible cost growth in an REA;
- It generally results in higher negotiated settlement amounts;
- It accounts for errors in original cost estimates; and
- It generally leads to a quicker settlement.

The disadvantages of this approach include the following:

- It can be time-consuming and financially expensive to prepare;
- It can require more contractor resources than do other approaches, such as the total-cost method; and
- It usually does not account for the cumulative cost impact of more than one change.

Total-Cost Method

Unlike the detailed cost-buildup approach, the total-cost method is a one-step pricing approach. With this method, the equitable adjustment is calculated by simply subtracting the original cost estimate from the total cost of work performed (or to be performed). The total-cost method is illustrated in Table 1.

Total cost incurred and projected to be incurred on the contract (a)	$ 20,000000
Less the original cost estimate (b)	(8,000,000)
Total Cost approach REA (c)	$ 12,000,000

Notes:

(a) This amount is sometimes referred to as the cost estimate at completion (EAC). If the contract performance has been completed, then the total cost will simply be the total cost incurred on the contract.

(b) The original cost estimate must be adjusted to reflect previously approved price adjustments or changes to the scope of work.

(c) This amount is cost only; it does not include profit.

Table 1
Illustration of the Total-Cost Method

The total-cost method should be used cautiously. If it is not applied carefully, it may result in an overstated changed-work price. When the total-cost method is used, the equitable adjustment may be too large if the original estimate is unreasonably low or if the contractor's performance costs are unreasonably high due to contractor-caused inefficiencies. The boards and courts have recognized this problem and have directed that, in order to use the total-cost method, the contractor must prove that the following four conditions exist:

- The original price was realistic; that is, the cost estimates that formed the basis of the original price were reasonable and achievable;
- The actual costs incurred or projected are reasonable (i.e., costs are not higher than they should be);
- The contractor was not responsible for the cost growth; and
- The determination of the changed-work costs by any other method is either impossible or impracticable.

Government auditors and pricing personnel generally reject the total cost method for pricing REAs. Despite these hurdles, the advantages of the total-cost method include the following:

- It is easy to initially calculate;
- Its initial preparation is less costly than that of other methods;
- It maximizes the changed work estimated, since all of the cost growth is included in the REA (For the purpose of this method, cost growth is defined as the total-cost incurred or estimated to be incurred on the contract, less the original estimate.); and
- It is easy to understand and communicate to others.

The disadvantages of the total cost method include the following:

- It may inappropriately assign contractor-responsible cost growth to the customer (For example, a detailed analysis of the elements of the cost growth may reveal that some of it was caused by contractor inefficiencies or mismanagement. The total cost method does not involve such detailed analysis, as it assumes that every dollar of the cost growth was caused by the customer.);
- It assumes that the original price was a realistic estimate of performance costs, and this assumption may not be reasonable;
- No cause and effect relationships are shown between any government action or inaction and the increased cost incurred by the contractor;
- A much lower percentage of the claim is typically recovered with this method than is recovered with other methods;
- It is often unacceptable to government procurement officials or higher-tier contractor personnel;
- If the REA turns into a disputed claim and is reviewed by the BCAs or courts, it may be accepted only as a last resort -- and then only if safeguards exist to prevent over-recovery; and
- It generally delays the contractor's recovery, since government representatives or higher-tier contractor personnel may push to use the detailed cost-buildup approach – thus delaying resolution and increasing the effort and expense of the REA or claim estimating process.

Modified Total-Cost Method

A middle ground between the total cost and detailed cost-buildup pricing methods is provided by the modified total-cost method. The modified total-cost method is similar to the total-cost method, except that contractor-responsible cost growth is removed from the calculations and the original estimate is corrected for any bid errors or mistakes, if necessary. This method involves a three-step approach, as follows:

(1) The original cost estimate is adjusted for estimating errors and/or conscious decisions to bid the contract for less than the estimated cost to complete the contract. The adjustment of the original cost results in a "reasonable original estimate."
(2) Contractor-responsible performance inefficiencies are determined and deducted from the cost incurred, thus calculating the "adjusted actual cost incurred."
(3) The reasonable original estimate is subtracted from the adjusted actual cost incurred to determine the equitable adjustment amount.

These steps are summarized in Table 2, below.

	Amount	**Amount**
Total cost incurred and projected to be incurred on the Contract (a)	$20,000,000	
LESS: Contractor-responsible cost growth	(2,000,000)	
Adjusted actual cost incurred		$18,000,000
Original cost estimate (b)	$ 8,000,000	
PLUS: Adjustments to original cost estimate	2,000,000	
LESS: "Reasonable original estimate"		(10,000,000)
Modified total cost approach-REA (the adjusted actual cost incurred – the reasonable original estimate) (c)		$8,000,000

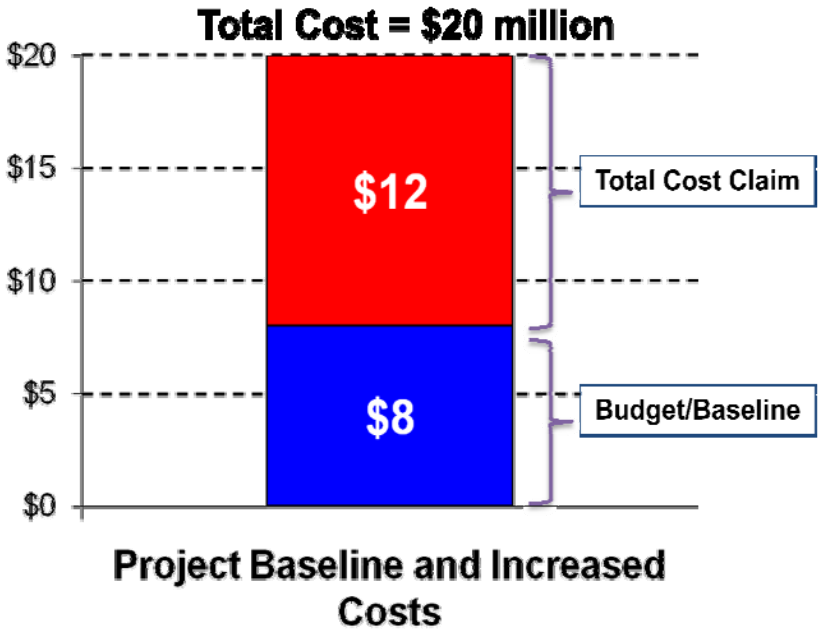
(a) This amount is the cost estimate at completion. If contract performance has been completed, then the total cost will simply be the total cost incurred on the contract.
(b) The original cost estimate must be adjusted to reflect previously approved price adjustments or changes to the scope of the work.
(c) This amount is cost only, it does not include profit.

Table 2
Illustration of the Modified Total-Cost Method

When it is applied properly, the modified total-cost method should approximate the detailed cost-buildup approach. The modified total-cost method may be the best possible method under certain circumstances, such as:

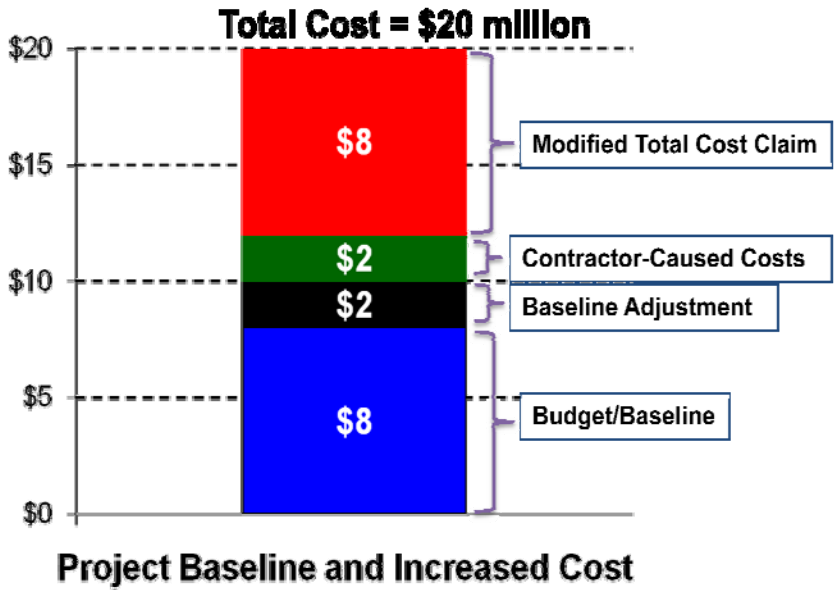
- Severe disruption;
- Pervasive design or specification problems;
- A complex, interdependent research, engineering, and production or service process that makes separate accounting difficult or impossible; or
- Massive changes that occur simultaneously.

The following chart represents a graphical depiction of a *total cost* claim of $12 million for a project with $20 million in actual costs:



Project Baseline and Increased Costs

The following chart represents a graphical depiction of a *modified total cost* claim for a project with $20 million in actual costs:



Project Baseline and Increased Cost

Regardless of the pricing method used, only a reasonable estimate needs to be made in order for the customer to approve the change. General principles of contract law establish that the price of a change need not – and often cannot – be calculated with certainty.

Improving the Modified Total Cost Method by Including Discrete Pricing Elements

In the *modified total cost* claim example, $8 million is the claim amount. A contractor can significantly strengthen its claim by including some *discrete pricing* elements and including an overview of the reasons for the cost growth. These enhancements assist the Contracting Officer in understanding the causes of the contractor's increased costs.

The inclusion of at least some of the discrete impacts that are captured in specific project accounting codes can also improve a *modified total cost* claim. Cost growth analysis should include a fact-intensive investigation of project records that explain, in some detail, why the project costs increased. For example, it may be possible to identify a particular change and reasonably measure its direct impact and increased cost.[6] In that instance, providing the detail on changes that can be separately measured along with the amount of increased costs identified in the modified total cost approach is a way to bolster the credibility of the total damages amount.

A review of the contemporaneous program records may reveal unajudicated change proposals and variance reports that provided causes and measurements of cost growth. These can be reviewed and updated and transformed into discretely priced changes that are evaluated as part of the overall explanation of contract cost growth.

DCAA's View of Contractor's Use of Combination Approach

The Defense Contract Audit Agency has included comments about a contractor's use of this combined approach in its audit manual.

The DCAA Contract Audit Manual states that:

> When a contractor computes damages using both total cost method and discrete costs, this may indicate that its accounting system was capable of segregating costs incurred specially on alleged change (s) but the contractor chose not to utilize the system's capabilities. Such information should be disclosed in the audit report.[7]

This statement could lead to the DCAA taking an 'all or nothing' view of discrete pricing (or of change order accounting). The nature of changes and their impacts often cause cost to increase across multiple functions and charge codes/accounts. This is because there are often multiple overlapping changes, unclear causation at the time that the costs are recorded and

[6] It may not be practical to measure the disruption or the cumulative impact associated with the priced changed or other changes that cannot be separately measured and priced.
[7] See DCAA Contract Audit Manual, Chapter 12, 12-704.1(e).

many project personnel recording costs. While a contractor may be able to set up accounts to capture some of the cost caused by changes, it is not always practical for a contractor to segregate all specific actual costs caused by the customer's changes. Contractors should be prepared to make this point to the DCAA and provide specific examples and support.

Prospective versus Retrospective Estimates

When employing one of the three pricing methods or the combination method discussed in the previous section, contractors may price REAs either prospectively (i.e., before all of the additional costs caused by the change have been incurred) or retrospectively (i.e., after the additional costs have been incurred). With prospective pricing, at least some of the changed work has not yet been completed. Therefore, the parties rely heavily on cost estimates instead of on recorded costs to determine the appropriate amount of price adjustment. Further, when incurred cost information is not available to help in pricing the change, estimates may be used to support the REA. Also, if a change deducts or substitutes work, the REA is necessarily based on the estimated costs (e.g., the work that was not done).

For retrospective pricing, the parties negotiate an equitable adjustment after the work is completed. At that time, information is often available regarding the cost incurred by the contractor. The cost incurred may also be segregated by department, Work Breakdown Structure ("WBS") or another category.

When using retrospective pricing, theoretically the best method of validating the REA costs is to present segregated, recorded cost information from the contractor's accounting books and records. Unfortunately, this may not be possible because it is often impractical for the contractor to segregate the costs related to the change. Frequently, the contractor seeking an adjustment must go back through its general accounting records for the contract and trace the specific costs attributable to the change. With changes that involve "ripple" effects, it is uncommon for the segregated cost accounts to contain all of the additional costs borne by the contractor. However, the contractor should gather as much documentation of incurred costs as possible in order to support its request.

Profit as an Element of Change Orders on Fixed Price Contracts

It is has been established that contractors are entitled to profit on changes and that this profit should be based on the nature of the work and the risks involved. This is consistent with economic principles of risk and return and relevant regulatory guidance including FAR 15.404-4. Commentators on government contract cost issues have written:

> The rate of profit included in an equitable adjustment should fairly reflect the nature of the work and the risks involved. If the change requires work that is

> more difficult or involves a higher degree of risk than the original work under the contract, the contractor is entitled to a higher rate of profit than that included in the original contract price, . . . Conversely, if the change requires work that is less demanding or risky than originally required, the rate of profit should be lower than the contract rate, . . .[8]

Regulatory guidance on profit rates can be found at FAR 15.404-4 Profit, Defense FAR Supplement Part 215.404, Department of State Acquisition Regulation 615.404-4 Profit and Engineering Federal Acquisition Regulation Supplement Part 15.404-4 Profit, as well as other agency supplements.

When determining the amount of profit to include with its REA, a contractor may propose any profit rate it deems appropriate. The contractor may consider several factors. For example, the amount of profit in an equitable adjustment should reflect the complexity of the changed work and any additions or reductions in risk that were assumed by the contractor. However, some contracts, such as construction contracts, often specify the overhead and profit rates that are to be applied to changes. If specific rates are not established to determine profit, the customer may use the structured approach provided in FAR 15.404-4 to determine its prenegotiation objective before equitable adjustment negotiations take place. The FAR provides that the same profit or fee rate used to price the original contract may be used if the work is similar. When pricing and evaluating profit, the CO or higher-tier procurement official is guided to take into account the following factors: contractor effort; contract cost risk; federal socioeconomic programs; capital investments; cost control and other past accomplishments; and independent development. (FAR 15.404-4)

Regulatory guidance instructs the CO that higher profit levels are appropriate when the following situations exist:

- The contract performance requires a high degree of professional and managerial skills;
- The purchase of needed materials requires a high level of effort;
- The contract performance requires a high degree of professional and managerial skills;
- The contract performance requires specialized facilities or other unique cost elements;
- The contractor demonstrates a desire and ability to effectively manage costs; or
- The contractor's independent technical development is significant in contract performance.

(FAR 15.404-4)

In addition to the regulatory guidance, profit on change orders is affected by practical considerations. These considerations include the following:

[8] "Administration of Government Contracts," by John Cibinic, Jr. and Ralph C. Nash, Chapter 8, Pricing Of Adjustments. *Copyright © 2002,* ***CCH*** *INCORPORATED.*

- Profit rates on other changes on the same contract (e.g., profit rates on other change orders – both formal and constructive, profit rates on previous or subsequent production options, and profit rates on Engineering Change Proposals);
- The projected profit rate for the entire changed contract;
- The actual profit rate experienced thus far on the changed contract; and
- For DOD contracts, the profit rate resulting from the application of the Weighted Profit Guidelines found in Defense Federal Acquisition Regulation Supplement ("DFARS") Subpart 215.404.

If profit is applied to delay costs, the contractor should be prepared for a challenge from the government auditors as it is not uncommon for government auditors to question profit on delay costs that have been included in the REA. This happens particularly in the case of REAs submitted under the Government Delay of Work clause, which specifically excludes profit (FAR 52.212-17). However the Delay of Work clause does not apply in situations involving constructive changes asserted under the Changes clause. When constructive changes are imposed on the contractor, the contractor is entitled to an equitable adjustment that includes an allowance for profit, notwithstanding the Government Delay of Work clause (DCAM 12-802.7).

In order to apply the concepts of pricing contract changes and applying profit to change proposals, each contractor should develop its own system for preparing changed-work proposals. The government also needs such a system in order to effectively evaluate change proposals. Such a process is discussed below.

Change-Order Cost Development Process

While it seems like a relatively straightforward exercise, the authors have found that some of the first steps required in the development of the priced change orders can be quite complex. Contractor and government personnel who price and evaluate change proposals may find their jobs to be easier if they develop standard change order proposal investigation processes. The following paragraphs outline such a process.

Step 1: Document the original pricing assumptions. The first step in pricing a changed-work proposal is to document the original contract pricing and the major assumptions that were used in preparing the contract proposal. These assumptions may include forward pricing rates, escalation factors, productivity improvements, cost estimating relationship ("CER") factors, so-called investment decisions and capital budget data. This information will later be used as a baseline against which to analyze cost growth on the contract.

Step 2: Roll forward to the current contract value. The next step in this process involves "rolling forward" the original contract proposal to the current contract value by adding the effects of all contract modifications. This exercise involves adjusting the proposal to reflect the current contract value and the current scope of work. A contract modification that increases the contractor's scope of work without increasing the contract value may account for cost growth.

Rolling forward the proposal can be done by contract line item, by Integrated Product Team ("IPT"), by WBS grouping, or by other categories.

Step 3: Summarize the costs incurred. In the third step of the process, the cost incurred on the contract should be summarized at the same level of detail as the rolled-forward contract pricing data. The recorded cost incurred (or cost estimate at completion ("EAC") can then be compared to the contract pricing data in order to determine where the cost growth occurred (i.e., at which particular contract line items, IPTs, WBS groupings, and so on.)[9] Results from the cost growth analysis can be used to direct the change order investigation process. The categories with the largest cost growth may need to be investigated to determine whether the contract change (s) affected them. In order to do this, it may be necessary to break down the cost growth analysis into major categories of cost. These cost categories could include material, equipment, tooling, labor by department or type (e.g., engineering, production, inspection, and test), and indirect costs by pool (e.g., engineering and production). Usage variances should be investigated.

Step 4: Relate cost growth to the contract. The fourth step involves relating the known cost growth (determined during the previous step) to the contract change(s).

Step 5: Estimate the impact of changes. The fifth step involves preparing estimates of the impact of each contract change. The previous steps should have helped the REA pricing team determine which company departments and contract areas, tasks, or line items were affected by each change. Step 5 employs the estimating methods discussed in other parts of this chapter (e.g., discrete estimates prepared using the detailed cost buildup approach, delay cost estimates of escalation or unabsorbed overhead, and disruption cost estimates).

Step 6: Develop a pricing model. The pricing model is developed in the final step of the process.[10] This pricing model, which may be embodied in a series of spreadsheets, can be used in assigning labor and overhead rates to the labor hours that were previously estimated. Developing a pricing model may involve the following tasks:

- Determining the average labor rates for the contract by period and labor category or department; and
- Determining the appropriate indirect rates by cost element (e.g., material burden, production overhead, and engineering overhead) and period.

[9] The authors have found that measuring the absolute cost growth as well as percentage change is useful in identifying specific categories for follow-up. Categories that have had significant overrun by percentage even though the dollar amount may not be as significant as others may provide great examples that can be documented of the increased costs due to a specific customer change.

[10] It may be possible to leverage existing pricing models within the contractor's estimating organization for this purpose. At a minimum, it might be helpful to use the existing pricing model to serve as a secondary source to validate the pricing model used for the changed work.

Determining the Cost Impact of Delay

Delay changes arise when the customer is responsible for the increase in the total time required to perform the contract, thus entitling the contractor to a schedule extension and recovery of the associated delay costs. In order to recover delay costs, the contractor must first prove that delay occurred and was caused by the customer.

It has been well established that a contractor is entitled to an equitable price adjustment for extra costs incurred as a result of a customer-caused delay. The government's (or higher-tier contractor's) obligation to provide the contractor with additional compensation for delay is generally covered by the following contract clauses:

- Changes (FAR 52.243-1 – 52.243-7);
- Stop Work Order (FAR 52.242-15);
- Government Delay of Work (FAR 52.242-17);
- Suspension of Work (FAR 52.242-14);
- Differing Site Conditions FAR 52.236-2);
- Changes and Changed Conditions (FAR 52.243-5).

Even without such clauses, a delay may constitute a contract breach, thus allowing for the recovery of damages.

Common Delay Costs

Delay can cause the contractor to incur many different types of increased costs. The following sections examine some of the more common cost elements, including dedicated, direct-charge personnel, material and labor escalation, and unabsorbed overhead.

Dedicated, Direct-Charge Personnel

Performance extensions often cause the assignments of dedicated, direct-charge contractor personnel to be extended (e.g., the Program Manager may have to remain with the program for a longer period of time), which increases contractor labor costs. Dedicated contractor personnel are sometimes referred to as "core team" or "level effort" personnel. Core team personnel often work in areas such as program management, logistics, contract administration, engineering and manufacturing supervision, product assurance, quality control, and manufacturing support. Since these personnel are necessary to contract performance, when the contract is extended, they must continue charging all of their time directly to the contract. The additional hours that

they incur because of the delay will exceed the hours specified in the original contract budget. For the purpose of changed-work pricing, the core team typically is comprised of the following members:

- Those personnel whose roles or responsibilities are reasonably fixed or time-related in nature, such that the extension of the contract period of performance forces these roles or responsibilities to also be extended; and
- Those personnel whose cost is charged directly to the contract. Personnel costs that are indirectly charged (e.g., production overhead and general and administrative expense) are more often included in unabsorbed overhead.

Core-team personnel costs are a function of time (i.e., the period of performance) rather than the level of production within a relevant range of activity. Boards of Contract Appeals have recognized that a contractor is entitled to recover its additional time-related costs that are attributable to a government-caused extension.

Escalation

Escalation is the cost of performing the unchanged work in a later time period.[11] This cost can be more than just inflation. For example, material escalation may result if vendors and suppliers charge higher unit costs because of decelerated delivery schedules (since they are making fewer units, the cost of making each unit – along with the price – increases). Additionally, labor escalation may result if labor rates increase over time. Contract delay can also cause a change in the labor force mix, thus increasing the contractor's performance cost (i.e., higher-paid personnel may be assigned to the contract for a longer time than was originally planned and may end up doing work that was originally assigned to less-experienced or lower-cost staff). Contractors must factor in all such cost escalations when pricing delay REAs.

Some contracts included escalation clauses. The contract should be reviewed to determine if the contractor is entitled to a contract adjustment under the clause and if a method for measuring the increased cost due to escalation is proscribed. One method of estimating the impact of the escalation of direct – labor rates involves a comparison in (1) the direct-labor rates at the midpoint of the direct-labor hours actually incurred, with (2) the direct labor rates at the midpoint of the direct-labor hours that would have been incurred if there had been no government-caused delay. These midpoints can be determined by identifying the month in which the fiftieth percentile (i.e., the midpoint) of the direct-labor hours was, or would have been, incurred. To estimate the escalation in direct-labor rates between the two midpoints, contractors often utilize published inflation indices. The impact of labor-rate escalation is then calculated by multiplying the change in escalation factors by the direct-labor cost for the original

[11] It is assumed that changed work is priced using the applicable rates for when the changed work is performed. Therefore, the focus in this section is on work that is relatively unchanged in scope but which is being performed in a later time period.

scope of work, or the labor hours that are not otherwise part of the REA. (Note that this method measures the impact of labor-rate increases over time but does not measure the impact of labor-mix changes.) Similar approaches may be used to estimate the cost impact of material escalation.

Many other methods of estimating the impact of labor and material escalation exist. With any method, the contractor should prove that escalation did occur (e.g., that labor rates or material costs did increase). As with other claim components, the methods that tie damage amounts most closely to the underlying causal events are favored most.

Unabsorbed or Extended Overhead

In addition to the direct costs discussed thus far, contractors must recover the increased indirect costs caused by delays. Normally, indirect costs are recovered as a percentage markup on direct costs during contract performance (e.g., engineering overhead is recovered as a percentage markup on engineering direct labor). However, during a contract delay, the fundamental relationship between direct costs and fixed indirect costs continue to be incurred at "normal" levels. This results in the same level of fixed indirect costs being allocated to a smaller direct-cost base (i.e., overhead allocation rates are higher than they would have been if the delay had not occurred). The higher indirect rates generally affect all, or many, of the contractor's other contracts, which must absorb the indirect costs that the delayed contract would have absorbed had the delay not occurred.

The allocation of added cost to cost-type contracts can affect the amount of fee recovered, since the government often adds funds to the contract to compensate the contractor for the extra costs, but not necessarily to increase the fee. If the fee is not increased, the contractor will have performed the additional work without receiving any profit for its efforts and the overall profitability of the program will decrease. However, on cost-type contracts, the added overhead is generally recovered. For fixed-price contracts, the incorrect or inadvertent allocation of additional costs often directly offsets profit or increases the contractor's loss. Unabsorbed and extended overhead REAs are intended to compensate the contractor for damages caused by this economic and accounting phenomenon.

Indirect-Cost Accounting Principle

When typical accounting procedures are used, all indirect costs (both variable and fixed)[12] are allocated to the work that is actually done during a given period. When the performance of a

[12] Indirect-cost pools contain certain costs that neither increase nor decrease in proportion to the volume of work performed. These costs are generally described as time-related and cannot be avoided when the volume of work decreases unexpectedly. Such costs

particular contract is delayed, the contractor's other contracts receive a greater allocation of indirect costs than they otherwise would have, without receiving any corresponding benefit. The increase in indirect-cost allocations resulting from government-caused delays result in extended or unabsorbed overhead REAs.

Conceptual Basis of Continuing Fixed-Cost REAs

The theoretical underpinning of continuing fixed-cost REAs is that the benefits of the contractor's productive capacity are time-related rather than volume-related. Generally accepted accounting practices most often use the allocation of a pro rata share of all capacity (i.e., fixed) costs to each accounting period benefited, regardless of the level of productive activity. Accordingly, the cost of capacity set aside by a contractor to perform a contract cannot be avoided when contract work is extended. Therefore, the extension of the contract schedule increases the total cost of performance.

Cost Impact

If the duration of the delay is uncertain, the contractor may find it difficult to impossible to reduce its fixed overhead costs in order to avoid the economic impact of the delay. Some capacity costs (i.e., fixed overhead costs) that should have been allocated to the delayed contract are, instead, allocated to other work. Because of this damage, the contractor should receive an equitable price adjustment under the theory of either unabsorbed or extended overhead.[13]

Proving Responsibility of Delay

In order for a contractor to recover the damages described previously, the delay usually must directly affect project completion. It is not enough the troublesome events occurred and project completion was delayed. The late completion of the contract must have been caused directly by the alleged events and problems in order for the contractor to recover extended performance

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are fixed, at least in relation to the relevant operating ranges and short time frames. Fixed indirect costs usually include the following:

- Facilities-related costs (e.g., depreciation, utilities, taxes, insurance and equipment rental);
- Project management and supervision costs;
- Quality control, shop support, and security costs;
- Some portion of home office or corporate overhead; and
- Some engineering.

[13] There are various methods for measuring extended or unabsorbed overhead as well as different proof requirements. The authors advise consultation with counsel on the development of these REAs.

costs or receive a time extension. That is, the cause-and-effect relationships between events and delays must be demonstrated.

Critical-path delays are those that delay the overall (or substantial) contract completion. (Not all changes to the contractor's performance result in such a delay.[14]) Requests for delay damages and time extensions are often denied because contractors fail to prove adequately that the delay was on the critical path and, but for the change, the contract or program would have been completed to the schedule. Typically, the failure of proof involves the inability to establish a causal link between an event and the overall contract delay. Identifying activities that are critical and the impact of delays upon these critical activities requires a thorough analysis of the contractor's intended manner and sequence of performance, the nature of the affected activities, and other considerations.

Determining the Cost Impact of Disruption

Disruption is generally defined as the loss of efficiency on a contract due to customer interference. This interference can result when the customer hinders performance directly, or it can result as a ripple effect from the previously discussed, customer-caused changes or delay. Disruption is distinguished from delay in that delay is time-related, while disruption is related to the loss of efficiency. Disruption does not necessarily stop performance, but rather, causes the contractor to perform less efficiently than it would have if the customer had not interfered. The contractor is entitled to recover disruptions costs, including those due to lost efficiency, as part of an equitable adjustment under the Changes clause. Although disruption REAs often include the cost of false starts, rework, and inefficiencies in resolving problems, these costs are recoverable only when they are caused by the customer. Examples of customer-caused disruption include the following:

- Defects or deficiencies in customer-furnished drawings, specifications, materials, and/or equipment;
- Improper inspection or approval procedures, including delays in inspecting and approving contractor work;
- Interference with, or failure to follow, contract procedures for the review and approval of contractor design submittals;
- The customer's failure to appropriately fund the contract;
- The customer's insistence on excessive or improper testing requirements or procedures; and
- The customer's adoption of excessive or improper quality control or quality assurance procedures.

[14] Impact or changes to non-critical activities are still relevant and may provide the basis for an increased cost claim on the contract. They just may not be the causal link to delay in completion of the contract.

As with the pricing of other types of changed work, the methodologies that tie damages most closely to specific customer-caused inefficiencies are the most successful. Less-specific approaches to damage calculation generally result in lower rates of recovery. The causal relationship between a particular event and the subsequent disruption or loss of productivity is often complex and difficult to measure precisely.

Some commonly used methods of measuring disruption or loss of productivity include Measured Mile (e.g., comparing the productivity experienced on a less impacted period to the productivity experienced on a heavily impacted period), Learning Curve (e.g., analyzing the impact of changes on the loss of worker learning and the resulting higher labor costs) and various statistical methods utilizing regression analysis.

Contracting officers and contractors have dealt with the uncertainty in measuring disruption by developing factors (some of which are program specific or site specific) to be used. These agreements are sometimes documented in Memorandum of Agreements or other administrative documents between the parties. While some of the these agreed-to factors are more typically involved in estimating more standard changes, they can be useful both as a technique to estimate the amount of disruption experienced as well as serving as a secondary check on the independent disruption estimated developed.

The construction industry has some factors that are published and used to estimate increased costs from loss of efficiency due to overtime fatigue, the stacking of trades and other categories of change.[15] Similarly, NAVSEA published guidelines many years ago on measuring disruption from changed work in the shipbuilding industry.[16]

Conclusion

When pricing or evaluating a change order, REA or claim resulting from a contract change, it is critical to connect the causes of the change to the additional cost or time requested. A contractor must prove that its pricing results from careful analysis of the effects of the change. Generally, the more detailed those calculations and justification, the better the chances of recovery. Also, the customer and its auditor, DCAA (or agency-specific auditors), prefer that, whenever possible, pricing include recorded costs incurred as opposed to estimates using other methods of comparison. Thus, the successful recovery of change-related costs depends on careful analysis and documentation.

[15] Some of the more well known and used factors in the construction industry include the Mechanical Contractors Association of America cost manual, the Corps Of Engineers Modification Impact Evaluation Guide and the Construction Users Roundtable. There are many others.

[16] Guidelines on Factors Influencing Cost for Forward Pricing Change Order Disruption, Delay , Acceleration and Cumulative Effects

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The authors have assisted clients on a variety of matters including: (1) preparation and review of requests for equitable adjustments and claims involving changed work, delay and disruption; (2) consulting on matters involving allegations of defective pricing, false claims, mischarges and other improper billings to the government; (3) consulting on hundreds of contract terminations including terminations for convenience and for default; (4) regulatory consulting on allowable costs issues arising from the Cost Principles (i.e., FAR Part 31) as well as allocation of cost issues associated with the Cost Accounting Standards; (5) Multiple Award Schedule contracting including the Price Reduction Clause; (6) Purchasing system reviews, assessment of compliance with federal regulations; and best practices reviews, and (7) management consulting. The authors have provided expert testimony on many of the issues listed above.