Techniques for Calculating Unabsorbed Overhead

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Abstract

The technique for calculation of home office overhead damages, a claim category on construction projects, has been widely debated. The Eichleay Formula is a well known technique for such claims, that evolved over the past 47 years. This paper provides concepts of compensable home office overhead damage due to a project delay, the evolution and required prerequisites for using the Eichleay formula, and alternate formulas and techniques used. A "Direct Method" is proposed, which is simpler to apply. In the final analysis, obtaining a 100% accurate estimate of home office expenses is impractical, if not infeasible.

Keywords: Eichleay, Compensable, Home Office, Claim

1. Introduction

Home office overhead expense damages incurred due to project delay are called 'unabsorbed overhead'. The most commonly applied method for calculating home office overhead claims for damages due to delay is the "Eichleay Formula". This paper focuses on several areas relating to the Eichleay Formula and its evolution, and provides an explanation of the elements of the formula and alternate formulae for calculating unabsorbed overhead. The paper will present criticism surrounding the use of the Eichleay Formula. Various techniques for calculating unabsorbed home office overhead will be presented, and the results will be compared and analyzed. All known techniques have been pulled together in this study.

2. Items in Home Office Overhead

Home office overhead normally consists of costs such as rent, utilities, furnishings, office equipment, executive staff salaries, support and clerical staff salaries, project related staff (engineers, estimators, schedulers), mortgage costs, outside legal and accounting expenses, depreciation, auto travel, professional trade licenses and fees, employee recruitment, relocation, training and education, photocopying, entertainment, contributions, donations, postage, cost of preparing bids, review of submittals, taxes, advertising, insurance premiums, interest costs, and data processing/computer costs. The contractor needs to pay or recover these costs by allocating these costs to the projects it performs (Taam and Singh, 2003). The unabsorbed

home office overhead that will be discussed here consists of the home office overhead for which the contractor is not paid for work that is really compensable.

3. Evolution of the Eichleay Formula

3.1 History of the Formula

Before 1940, unless expressly permitted by the contract, the contractor could not recover consequential damages for government delay (*McCord v. United States)* [i]. The bias towards owners is found to increase as one checks case law further back in history. The U.S. government's position in earlier centuries was simply that it had paid for the right to change the contract. In 1945, however, in the case of *Fred R. Comb Co. v. United States* [ii], the Court of Claims found the government liable to the contractor for home office damages caused by delay. The court also found that the government, having breached its contract, had no right to state that a contractor will go uncompensated. This laid the foundation for the emergence of the Eichleay formula, which set up criteria and formulae for calculating compensation due to the contractor.

The Eichleay Formula originated from a decision by the Armed Services Board of Contract Appeals in 1960, *Eichleay Corporation v. United States* [iii]. In its appeal before the Board, the Eichleay Corporation proposed a formula for calculating the damages. The Board accepted this formula as a reasonable method for calculating the damages (Trauner, 1990).

3.2 The Eichleay Formula

The Eichleay formula is a three-step process as per the following formulae:

(Actual Billings for Delayed Contract x Total Actual Billings for Period (All Contractor Contracts)) ÷ Total Home Office Overhead for Period = Overhead Allocable to Delayed Contract (OACD) -(1)

OACD ÷ Days of Performance = Daily Contract Overhead for Delayed Contract -(2)

Daily Contract Overhead for Delayed Contract x Number of Days Delay = Overhead Claim Amount for Delayed Contract -(3)

A step-by-step example of the Eichleay Formula, using the data in the example shown later, yields a value of $6,667.

The Eichleay Formula first determines the allocation of home office overhead for a particular project. Next, it takes a portion of the allocation and applies it to the total days of performance, which results in a daily home office overhead cost. Finally, the Eichleay Formula calculates compensation due to a contractor for an owner-caused delay by multiplying the daily overhead rate with the days delayed. The formula is an attempt to provide a realistic basis for allocating home office overhead costs.

3.3 Acceptance of the Eichleay Formula

Since its inception, the Eichleay Formula has gained considerable acceptance, but courts and boards have generated numerous opinions concerning its application, going alternately back and forth on it. For example, in *Excavation-Construction, Inc. v. United States* [iv], the board recognized the use of the Eichleay Formula to determine the cost not only of a suspension of work, but also of a delay caused by extra work. In *Wickham Contracting Co. v. Fischer* [v], the 3rd Federal Circuit held that the Eichleay formula was the exclusive means available for calculating unabsorbed overhead, overruling the earlier decision by the GSBCA (General Services Board of Contract Appeals). In *Capital Electric Co. v. United States*[vi], 1984, the 2nd Federal Circuit reaffirmed the applicability of Eichleay. However, disputes continued as to whether the Eichleay formula was the only correct method and whether other formulas led to a more accurate calculation of unabsorbed overhead (Peckar and Abramson, 1999).

3.4 Arguments against the Eichleay Formula

The most common argument against the use of the Eichleay Formula is that the contractor is already compensated for home office overhead in his markup of direct costs on changes, and therefore, requires no further compensation. The problem with this argument is that a contractor receives the markup regardless of whether or not the change causes a delay.

The Eichleay formula is often challenged and criticized in two principal areas by auditors, private and government attorneys, and judges. These two areas are (1) the overall concept of unabsorbed overhead, as covered in the Eichleay formula; and (2) the accuracy of the formula. In *Wickham Contracting Co. v. U. S. Dept of Defense* [vii], the GSBCA claimed that Eichleay was entirely theoretical, and that *the Eichleay formula, which is a simple proration, cannot give a correct result because it has no mechanism for allocating wasted overhead where there are two or more delay sources* (Kaufmann and Holman, 1995).

Cibinic (1991) also took issue with the Eichleay formula by stating:

> *The Eichleay formula does not take into consideration the first and most important factor --- how much fixed overhead would have been allocated to the contract. In addition, it calls for a determination of the total overhead incurred during the contract period. This too, is defective; since fixed overhead (the subject of unabsorbed overhead) is incurred for accounting periods (usually the contractor's fiscal year), not contract periods (which would equate with the contractor's fiscal year in only the most rare and unusual coincidence).*

3.5 Abrasion and Reinstatement of the Eichleay Formula

As a result, courts minimized the formula in the late 1970's and early 1980's. A judge for the GSBCA predicted its complete demise. Non-government contract forums were the first to reject the use of the Eichleay formula; courts in New York[viii] and Texas[ix] both refused to apply it in

construction delay cases. The low point for Eichleay was the GSBCA decision in *Capital Electric Co.*[x], where Judge Lieblich stated:

[We can be confident] … that the government will never again go along with any payment to a contractor for "extended overhead" nor will it ever again agree to the application of the Eichleay formula to any overhead calculation in a construction case. Whether distinguished or overruled, those prior decisions will be dead letters hereafter.

Within one year, however, the U.S. Court of Appeals for the 2nd Federal Circuit reversed the *Capital Electric* decision and reinstated the contractor's right to utilize Eichleay.

3.6 Compensability Criteria for the Eichleay Formula

Since the inception of Eichleay in 1960, courts have required prerequisite criteria to determine whether a particular situation would qualify for application of the Eichleay Formula. The first criteria is the uncertainty of the delay or standby period, and the second criteria is the "practicality" and "possibility" for the contractor to take on additional work, which would "absorb" the home office expenses during the period of delay. "Standby" is defined as an order by a contracting office to not perform any further work on a contract until requested to do so by the contracting officer.

The first criteria was upheld in *Community Heating & Plumbing Co., Inc. v. Kelso* [xi]. Again, in *C.B.C. Enterprises, Inc. v. United States* [xii], the contractor appealed the Navy's denial of an extended overhead claim. The courts found that there was no suspension, delay, or disruption of work and that the period of performance was known. Recovery is permitted only when a "cloud of uncertainty" exists regarding the period of performance.

In *Interstate General Government Contractors v. West* [xiii], the contractor claimed unabsorbed overhead costs because of government-caused delay subsequent to a standby. In this case, the project was completed 13 days early, but the standby was prolonged. The Federal Circuit implemented a three-part test that needed to be met whenever a contractor completes a contract early:

- The contractor must prove that it intended to complete the contract early.
- the contractor must prove that it had the capability to do so, and
- It must prove that it actually would have completed early, but for the government's action.

The test is to assure prevention of a contractor receiving double payment on its overhead claim.[xiv] However the universal rationality of this test does not seem to have been established. The test is much like the victim of an injury in torts having to prove he had no intention to injure himself, a requirement that is not entertained in modern tort law.

In *Wickham Contracting Co. vs. Fischer*, the Federal Circuit court affirmed that the Eichleay Formula was the exclusive formula to use to calculate home office overhead damages when the Eichleay prerequisites were met. The prerequisites for use of the Eichleay formula are standby with uncertainty, and the impractical ability to take on additional work during the delay period to absorb the home office overhead. Since Wickham, the question in most government delay damage cases has been more a question of entitlement instead of a contractor having to prove damages in order for use of Eichleay.

In *West v. All-State Boiler* [xv], the court found that the government could not meet its burden by showing either: "(1) that it was not impractical for the contractor to obtain other work to which it could reallocate its indirect costs; or (2) that the contractor's inability to obtain other work was not caused by the government's suspension…" This decision further clarified the second prerequisite of a contractor not having to prove that it was impossible to take on new work, but only that it was impractical to do so (Peckar and Abramson, 1999).

In *Melka Marine, Inc. v. United States* [xvi], the Court further clarified that when the government identifies with certainty the date on which its delay will end, the standby test is not met. Standby requires an uncertain delay period where the government can require the contractor to resume work.

Naturally, many of these prerequisites are harsh and unwarranted, making recovery quite an onerous task for the contractor.

4. Alternate Techniques and Formulas

4.1 Other Formulae and Techniques

Critics of the Eichleay formula have suggested the use of various formulae and methods for use in calculating unabsorbed overhead damages, depending on the situation. Alternate techniques include ten methods, including one designed by the authors. These are the Comparative Absorption Rate Method (CARM), Burden Fluctuation Method, Carteret Method, Allegheny Method, Canadian Method, Modified Eichleay Method, Calculation based on Actual Records, Total Direct Cost Allocation Method (DCAM), Specific Base Allocation Method (SBAM), and Direct Method. Not all the methods can be discussed here for want of space, but the most important and representative ones will be described. The interesting factor about these alternate techniques is that they do not come with strings attached, such as the prerequisite criteria of Eichleay. Such is the nature of case law on this topic.

The following example will be applied to above methods to calculate unabsorbed home office overhead (McDonald and Baldwin, 1989). A summary of the results for comparison purposes is provided later.

4.2 Example Situation

The example applied to the formulas and methods to follow, is described: A project could have been performed by the contractor for a price of $400,000 over a four-month duration assuming no change orders were issued, and no suspensions of work or other delays were encountered. The contractor, in this example, has a fixed home office overhead rate of $40,000 per month, has $100,000 of monthly billings on this contract, has $400,000 per month from other contracts, and thus regularly does $500,000 worth of total business per month including the contract in question.

Under the contractor's "potential performance," contract billings are made through months 1 and 4 (both inclusive). Total billings stay at $500,000 for all months and reflect what would have happened but for any changes or delays by the owner on this project.

In the "actual performance", there is a one-month suspension in the third month: the contractor has to forego contract billings for that month, but still must carry a home office overhead. Thus, while total billings are $500,000 for all months, they fall by $100,000 in month 3.

4.3 4.3 Burden Fluctuation Method

This method determines unabsorbed overhead by finding the increase in the absorption rate and allocating that increase to the non-contract work, which was forced to bear more than its fair share of overhead expenses. The burden fluctuation method has been used by courts and boards to calculate manufacturers' unabsorbed overhead claims.

Total Billings - Contract Billings = Other Contract Billings -(4)
Actual Overhead Rate - Potential Overhead Rate = Burden Fluctuation -(5)
Burden Fluctuation x Other Contract Billings = Unabsorbed Overhead Claim -(6)

Under the Burden Fluctuation Method, the contractor could claim a 0.33 percent increase in his overhead rate for the example considered, resulting in a claimed amount of $6,600.

4.4 Modified Eichleay Method

The Eichleay Formula tends to understate the overhead rate because it considers and includes the delay period in the formula calculation for the disputed contract. The Modified Eichleay Method changes this by deleting the days of delay from the number of days in the contract performance period (Equation 8). The result will be a higher Daily Overhead Rate. The Modified Eichleay Formula is provided below. A simple calculation yields unabsorbed overhead = $8,333.

Actual Billings for Delayed Contract ÷ Tot. Actual Billings for Period (All Contractor Contracts) x Total Home Office Overhead for Period = OADC - (7)

OADC ÷ Days of Performance (less delay period) = Daily Contract Overhead for

Delayed Contract - (8)

Daily Contract Overhead for Delayed Contract x Number of Days Delay = Overhead Claim Amount for Delayed Contract - (9)

4.5 The Canadian Method

This method is used extensively in Canada (Trauner, 1990). The Canadian Method uses the contractor's actual markup for overhead in its calculation. This markup is based on bid documents or audit records. An audit of the contractor's records will determine a percentage based on history. The result for the example is $8,000.

Percentage Markup (from bid docs or audit) x Original Contract Sum ÷ Original Number of Days in the Contract = Daily Overhead Rate - (10)

Daily Overhead x Number of Days of Compensable Delay = Compensation for Home Office Overhead - (11)

4.6 The Allegheny Method[xvii]

This formula focuses on the difference in overhead rates between the actual period of performance and the originally expected period of performance. The excess overhead rate is multiplied by the contract base costs to determine the unabsorbed overhead amount. This method yields only a rough order of magnitude estimate of the damage, since the two periods will be intermixed and the excess overhead is calculated on the costs of the contract amount (Cibinic, 1991). For the example, unabsorbed overhead = 0.33% * $2,400,000 = $7,920.

Incurred Overhead Rate during Actual Period - Incurred Overhead Rate for Projected Performance Period = Excess Rate of Overhead - (12)

Excess rate of Overhead x Base Costs of all Contracts = Unabsorbed Overhead - (13)

4.7 Total Direct Cost Allocation Method

The Total Direct Cost Allocation Method allocates the direct costs incurred to calculate the overhead rather than what has been billed (Hewitt, 1986). The calculation for the method is as follows. For the example, unabsorbed overhead = $10,000 * 1 = $10,000.

Overhead Applicable to the Disputed Contract, OHDC = Disputed Contract Direct Costs x Total Company Overhead ÷ All Other Contract Direct Costs - (14)

Daily Overhead Rate, DOR = OHDC ÷ Days of Contract Performance (less delay days)- (15)
Overhead Cost Claimed, COH = DOR x Days of Delay - (16)

The total direct cost approach suffers from a number of weaknesses. It does not consider the differences in the cost components from a contractor's various projects. The methodology assigns the same overhead rate calculation to every project. Normally, rates are determined based on the type of work involved in the contract. Overhead rates would vary based on the level of effort required.

4.8 Specific Base Allocation Method (SBAM)

SBAM is a substantially accurate allocation approach, but is also considered the most complicated and expensive to use (Hewitt, 1986). SBAM allocates overhead costs based on the specific characteristics of a job and each overhead cost element. SBAM would only be a practical approach if the methodology for collecting data was already in place or when the claim amount can justify the analysis expense. The method involves creating indirect cost pool accounts and a basis for allocating the accounts to each contract. This involves developing, comparing, and establishing cost relationships for all elements. The costs for overhead items are allocated to each job based on the established percentages of the overall item cost. Of the various established techniques, SBAM comes closest to counting the dollars in detail the exact way they are allocated. This is, of course, time consuming and tedious. For the example, unabsorbed overhead = $8,000.

Allocation Basis (AB) = Allocation Item Cost on Disputed Jobs ÷ Allocation Item Cost on All Jobs - (17)

Allocated Overhead of Pool Account (AH) = Pool Account Cost x AB -(18)

Average Daily Overhead (ADOH) = AH ÷ Total Contract Days - (19)

Claimed Overhead Cost s= ADOH x Days of Delay - (20)

4.9 Calculation Based on Actual Records

In the calculation of damages based on actual records, the contractor needs to provide detailed accurate records of his home office overhead expenses that will support his claim. In providing the records, the contractor will need to determine the percentage of effort expended for this project performance period or during the delay period. This percentage can be applied to the fixed home office costs, which will result in an allocation for the particular project (Trauner, 1990). This procedure requires detailed accounting procedures, from a record-keeping standpoint, which can be quite onerous. However, the effort may produce substantial benefits to the contractor, which might otherwise not be realized (Ernstrom and Essler, 1982). This method is very accurate if used precisely, and requires no formulas, which is a welcome benefit.

4.10 The Direct Method

The Direct Method is a method proposed by the authors, since it espouses a one-step calculation.

Planned Overhead Rate x Planned Earnings during the delay period = Unabsorbed Overhead - (21)

For the example, unabsorbed overhead = 8.00% * $100,000 = $8,000. The calculation of unabsorbed overhead should really not be more complex than this, and this reflects exactly what the contractor would have earned on the home office overhead had there been no delay or standby. The expected (i.e. planned) production during period of delay can be known from client-approved contractor schedules, the information for which should be readily available. On complex, high-volume projects, especially those of the Department of Defense, earned value reports are mandatory, so the expected earnings should be available and easily acquired. For this particular example, the result of the Direct Method agrees with the Canadian, Comparative Absorption Rate, the Carteret, and Specific Base Allocation Methods. The important factor in the "Direct Method" is that the planned earnings are based on the latest updated schedule. There needn't be any interference from Total Billings in the calculation of unabsorbed overhead for a specific project, and the Direct Method has taken this into account. The Direct Method is much less convoluted than the other methods presented. It consequently appears evident that attorneys and judges, in their ignorance of construction engineering and management, have made a simple process as complicated as possible.

5. Summary of Unabsorbed Overhead Calculations

The results for unabsorbed home office overhead damage calculations for each alternative are provided below:

Burden Fluctuation Method	$6,600
Eichleay Method	$6,667
Allegheny Method	$7,920
Canadian Method, CARM, Carteret, SBAM and Direct Methods	$8,000
Modified Eichleay Method	$8,333
Direct Cost Allocation Method	$10,000

6. Discussion

The median result of all methods is $8,000. The mode is the same, as well. The Eichleay Formula calculation, at $6,667, is approximately 20% lower than the median. It appears that various claimants have used different, but rational approaches to calculate the value of unabsorbed home office overhead, each which have been upheld by courts and boards.

Results for the various alternatives and methods vary, predicated by the particular situation, conditions, and assumptions used in each particular method. All the alternative methods have

been used at some time or the other to calculate *compensable damages for unabsorbed home office overhead due to delay*. Each alternative and technique is based on assumptions, have their own formulas, their individual issues and weaknesses, and they all result in estimates or approximations of the damage.

7. Summary and Conclusions

The history and evolution of the Eichleay formula for unabsorbed overhead expenses, first developed in 1960, were presented and discussed. The calculation of unabsorbed overhead still continues to dog owners and contractors alike. Multiple issues and criticism has risen on the use and application of Eichleay. Case law and court decisions that shaped the prerequisite criteria for use of the Eichleay were studied, and alternate methods and formulae for the calculation of damages for unabsorbed home office overhead due to delay were presented. The calculation of the results were summarized and discussed.

The alternate methods have similarities and differences. Even critics of the Eichleay formula acknowledge the difficulty in the determination and calculation of delay overhead damage costs. However, many of these alternate methods utilize questionable assumptions, end up approximating the damages, and often result in some of the same problems alleged against the Eichleay formula.

An exact method or calculation is probably quite impossible to develop, unless actual overhead expenses are accepted, in which case dividing the extra expenses from contractual expenses can be a knotty problem. Therefore, the goal, given the circumstances, is to determine a fair allocation for compensating a contractor for the delay. Consequently, the Direct Method is proposed as an alternate method for the calculation of unabsorbed overhead. The Direct Method is a simple, straightforward, and realistic method for calculating unabsorbed overhead damages and is simpler to use and apply, using, as it is, only a one-step process. Subsequent to all the convoluted techniques studied, it appears reasonable to recommend the straightforward Direct Method, better even than the widely adopted Eichleay.

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