Chapter 12 Contracts

12.0 General

What is a contract? Simply stated, it is a mechanism for two parties to define what each will get out of a transaction.

There are many forms of business arrangements for contracting for goods and services of any kind of Enterprise. If you are in business, you contract with customers to sell your goods and services. In order to sell them, you purchase other supplies, raw materials, sub assemblies and services of one kind or another from suppliers. All of these require some agreement and understanding by both buyer and seller as to what will be supplied, by when, and what the buyer will pay to get them. This description, and all the understandings between the parties, become a contract when the parties put their signatures on it.

Contracts can take many forms with different characteristics that are applicable in different situations. I have had the opportunity to enter into many contracts -- both as a buyer and a seller -- with individuals, governments, and commercial businesses. They range from verbal agreements sealed with a handshake to contracts for $5 billion worth of work to take place over a period of eight years and defined by a stack of paper that would fill a room.

12.1 A Seemingly Dry but Vital Subject

I cannot overemphasize the importance of this part of your business activity and how often it is fouled up in practice. It sounds like a straightforward problem to work and one that an attorney is trained to do. Wrong! Attorneys are often very knowledgeable about standard clauses, (of which there are too many). They are well versed in the case decisions that affect or change the interpretation of those clauses, but they are not necessarily equipped to create the body of a contract that is unique to the product or task. In this sense there are good contracts people who are lawyers, but lawyers are not necessarily good contracts experts. In many cases the best contract expert may be the specialist who is going to do the actual work contracted for. Legal jargon generally obscures the intent of the contracting parties, and insures future work for the attorney. The best arrangement is to have the project engineer and an attorney work together to define the contract. None of the foregoing should be taken as a recommendation for the Enterprise attorney or their staff not to review every contract. That careful review is a vital part of the system of checks and balances.

With all the expertise and brilliance and best of intentions, there is no way to write a perfect contract, All things cannot be foreseen. You try to anticipate what could happen, and lawyers can be of considerable help in this area, but there is no such thing as a bulletproof contract.

One time about 35 years ago I was a member of a team finalizing a large ($2.5 billion) complex contract. When we got all finished and about ready to execute, we and our customer added a special provision at the end which stated, ***"None of the foregoing shall prevent the use of reason and logic."***

Now, you can just imagine how the lawyers on both sides reacted to that! They would not let those words be used in the body of the contract. Yet, that is exactly what we wanted to be understood. In the end, we compromised. The words came out of the contract body, and we inserted a preamble that said, ***"None of what follows in this contract shall prevent the use of reason and logic ".*** The lawyers begrudged us that because it wasn't technically part of the contract. But, it made the point we wanted to make to all those who would use that thick contract as a guide for what they were supposed to do, and those on the buyer side who would evaluate what was being done. *Don't do or let anyone else do something stupid because the contract says to. Take it up with the customer if you think it is wrong.*

12.2 Definitions

A contract is a documentation of the intent and expectations of two parties about a transaction between them. It must be clearly stated so that it *faithfully records a meeting of the minds of the two parties.* This is where most contracts fail. A contract defines what is being purchased and what the consideration or payment is in return. It also defines the terms and conditions under which the contract is executed. When must the product be delivered? Does it have to perform some function in order to be acceptable? When and to whom must payment be made? When does ownership transfer? Are there conditions on how the work must be done? Is there a warranty or guarantee? What if the buyer has a change of mind during the process?

12.2.1. Defining the Job -- the Work Breakdown Structure (WBS)

As part of defining the work to be done, it is helpful to create a diagram of the total job similar to a table of organization. This chart, which is called a work breakdown structure, defines every element of work deemed necessary. The WBS is generally organized by deliverable products and or services, with the activities needed to create them as sub-elements under those products. The WBS with its dictionary (which is akin to the charter that goes with each block on a table of organization) is a framework for assuring that nothing has been forgotten, and therefore defines the contract statement of work. It also provides a structure for costing each element of work for the contract. A simplified example of a WBS is included and discussed in Chapter 7.

12.2.2 The Test of Definition

Good contracts are negotiated agreements, not unilateral directives. Negotiations help the contracting parties to understand each other’s intentions and objectives. What do words such as "shall", "will", and "ensure" mean? A contract signed without understanding the implication of every word included and every word omitted in it is a potential time bomb. Your signature, unless obtained under duress, says you agree with everything in the contract.

In writing a contract, no matter how trusting and honorable the relationship, each party must assume that the other party will disappear shortly after the contract is signed and before the contracted work is done, and therefore two other people, who had no idea of what was agreed to or why, will have to complete the transaction based on what was written down. It should also be assumed that these other people may be dishonest and will take advantage of every ambiguity to avoid holding up their end of the bargain. These assumptions, by the way, are not theoretical. People do die or move on to other jobs. Companies change hands and the new party may have different mores than the party you shook hands with.

12.3 Matching the Contract to the Job.

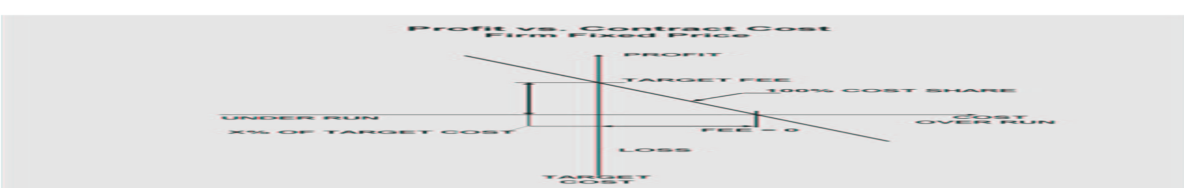
The purpose of this section is to examine what types of contracts are appropriate to what kinds of activities. We will start with the simplest. Contracts become more complex as unknowns associated with the product (and therefore risk) increase. Also in the case of contracts that require product development, the client may wish to structure the contract to balance such factors as performance and cost.

12.3.1 Simplest Types of Contracts

<u>A. Firm Fixed Price (FFP)</u>

A purchase order is placed for a catalog item at a catalog price. This requires no disclosure by the seller of the cost of the goods. The market sets the price. Negotiation of price is limited to the catalog price less any discount that the seller is willing to offer. This type of contract is the simplest form of a Fixed Price Contract. Note the conditions: A well-defined off-the-shelf item with no unknowns. Figure 12-1 illustrates the cost-profit relationship for this kind of contract. It should be noted, however that the seller has only to commit to the price, and the buyer has no knowledge of or interest in the actual cost in this type of contract.

It should be clear that the seller earns the maximum profit by doing the job at the absolute minimum cost. In this contract form, the old adage that a dollar saved is a dollar earned is precisely correct. If the job is to deliver components that meet a certain specification, the seller should and will cut every corner possible while meeting the minimum requirement of the letter of the contract. Federal Acquisition Regulations specify a default provision for fixed price contracts where if the seller defaults, the buyer can go hire a replacement contractor to complete the work at the first seller’s expense.



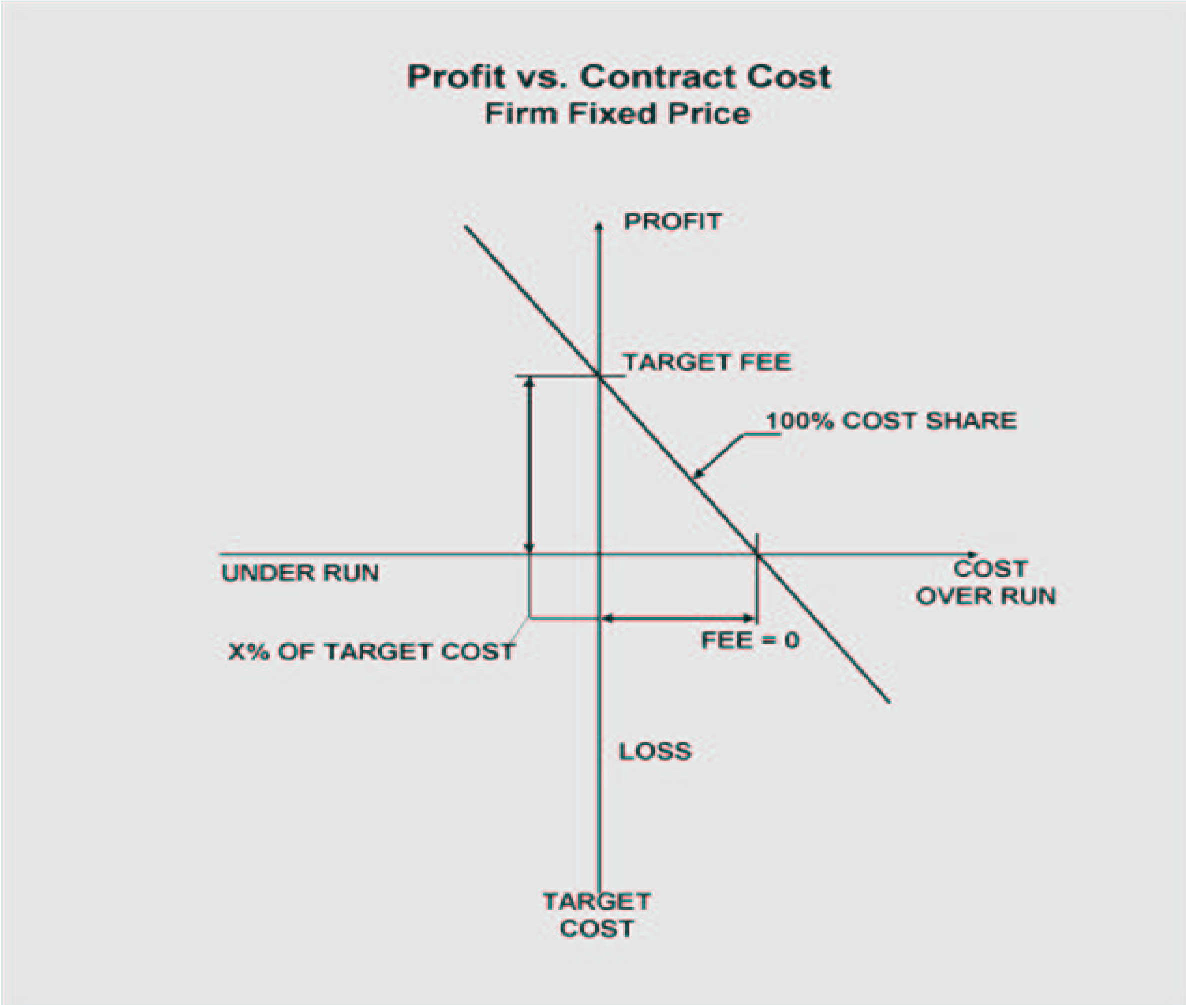


Figure 12-1 Fixed Price Cost-Fee Relationship

B. Cost Plus Percent of Cost (CPPC)

At the other end of the spectrum is a contract for services on a time and materials basis. Here, the buyer takes all the risk and is exposed to whatever the cost turns out to be. To at least assure that those costs are real, the smart buyer must have access to the seller's data on cost of labor, the hours expended, and proof of the cost of the materials. The seller must be willing to "open his books" to justify his costs. Under these conditions, the contract must provide for that information and agreement on the percentage of cost that will be profit. Generally, commercial forms of this type of arrangement would be called cost plus a percent of cost. This contract form is sometimes used for construction or contracts for services as directed by the buyer. Because of the lack of definition, it is the poorest form of what is called a *cost reimbursable contract* . in which the buyer is liable for the full amount of costs legitimately incurred in the conduct of the work.

In the case of a cost plus percent of cost contract, the seller is actually incentivized to increase cost because profit is a percentage of whatever the cost turns out to be. The buyer's only recourse is to stop the job. The only possible up side to the buyer in a cost plus percent of cost contract is that the buyer can direct changes at will without renegotiating the contract. But not having a paper trail of changes generally leads to disagreements when the bill is presented. Because of this and the reverse incentive on cost, most government entities do not permit cost plus percent of cost contracts to be used in their procurements. You shouldn't either!

12.3.2 Risk and its Implications to Contracts

In the commercial product market place, the development cost of the product is usually borne by the seller, who retains the ownership rights of the product design to sell into the larger market place. On the other hand, there are cases when the buyer seeks the development of a product and wishes to own the rights to the design at the completion of development, even if the buyer intends to continue buying from the same seller. An example might be that the buyer wishes to have multiple sources of supply, or sees the product as a vital part of the buyer's product line. In this case the buyer may pay the seller to do the development.

In contracting with the US Government for major facilities or defense systems, there is no commercial market, and in most cases the government does not want the resulting product sold to any other buyers such as foreign countries. This is called a monopsony. In these cases, the government usually insists on all rights of ownership and therefore pays for the development of the design and production tooling in many cases, reserving the right to put other sellers in business if necessary to have multiple sources of supply.

A. Development risk

If you make a deal to develop a product or system for a customer application or use, even if it is similar to something you have done before, it involves some risk. First, there is the risk that it will take more effort to complete the development work than you think. Second, you don't know exactly what the product will consist of until you have finished the design, and therefore what it will in fact cost. It is therefore very unwise, even foolhardy, to bid a fixed production price before you have done the development work. It is also unwise to bid the development fixed price unless you are prepared to make a substantial additional internal investment in the outcome. Generally we would not wish to do that if the customer paying for the development will own the design after it is developed.

The Rolls Royce L1011 story

In the late 1960s, Lockheed and McDonnell Douglas and the major engine suppliers were locked in a vicious competition for share in the wide-body passenger aircraft market. Rolls-Royce contracted with Lockheed to deliver a specified number of RB211 Fan-jet engines for the new wide body Tri-Star L1011 aircraft at a fixed price. Aircraft engines are tailored for and uniquely integrated into the designs of specific aircraft, and both designs depend on each other. This engine promised to be a very quiet and fuel-efficient unit compared to any other engine then in existence, but much development work remained to be done.[8] Rolls was happy because the development launched a new family of engines, derivatives of which could be sold for many other aircraft. Lockheed was happy because it was getting a superior engine at a fixed price that would competitively position the aircraft without risk of added development costs.

Rolls Royce encountered serious problems during development of the RB211. None of these were show stopping, but the costs incurred pushed the prestigious Rolls Royce into bankruptcy and nearly took Lockheed with it. Lockheed which thought it had a bullet proof arrangement with Rolls, found itself without engines, a situation that turned customers to the competitor DC-10. The British government rescued Rolls Royce, but Rolls never fully recovered. Lockheed was forced by its banks to get loan guarantees for its loans backing its own development costs. Did Lockheed get what it thought it would for a fixed price? It did not. The contract was renegotiated to a new schedule and cost. Eventually the engines and the aircraft proved to be a technically superior combination. But the L1011 program never broke even.

B. Multi year economic risks

Contracts that span more than two years involve a significant risk associated with economic factors. As an example, in the early1970's the US annual inflation rate exceeded 12% at times, fueled in part by the Arab oil embargo, and the so-called stagflation of the Carter years. The annual cost of money in those times rose to 17 %. A seller with a fixed price contract signed in the early 70's with completion late in the decade would have been forced to absorb cost increases of 20% or more. It was even worse if one had to borrow.

C. Dealing with Government

As mentioned earlier, governments, whether local, state, or federal, create monopsonies for many of the products they buy. If you are a construction contractor for public works projects, or if you are a defense contractor bidding work from the federal government, there is effectively only one customer. The risk in this is that the buyer may unilaterally establish terms of contracting with no free market check and balance to mitigate this unilateral power. Under these circumstances, the buying agency often chooses a contracting form with terms that do not fit the real objectives of the procurement. The only game in town can be a bad game indeed. Many defense contracts have been agreed to that were totally inappropriate for either party because bidders were not willing to say "no thanks" to a big but bad opportunity; The U.S. Navy's ill-fated A-12 program was a classic example.[9] In the end it did no justice to the buyer or seller.

Many government entities have the experience and the integrity to have standard contracting terms that are equitable and sensible. The federal government, for example, has the Federal Acquisition Regulations (FARs), which originated in the Department of Defense. They also have provisions for tailoring these terms to the unique needs of the specific procurement. So again the right approach is frank discussion before the bidding process begins to seek to modify the terms that are problematic.

D. Let the seller *and* buyer beware

Even if competitors will do so, integral managers on the seller's side will not play the only game in town. They will seek to convince the buyer of the potential dangers of the terms of his game, and if they cannot do so, they will walk away from a bad bid. Their responsibility to their stakeholders demands it. If the buyers are worth a hoot, they will listen to the potential supplier who will refuse to bid on the seller's terms, and will have more respect for that potential bidder. If the buyers will not listen, they are not worth making a contract with in any case. The buyers, by the same token should beware of a seller who will accept any terms without question.

12.3.3 Effective Cost Reimbursable Contracts

A. Cost Plus Fixed Fee (CPFF)

Cost plus fixed fee contracts are usually used when the buyer and seller are not certain about what is to be bought or the problems that might be encountered. To reduce the incentive for the seller to spend more time on the job than necessary, sometimes the fee is defined as a percent of the estimated or target cost, and does not change in dollar amount even if the cost exceeds the estimate (which it usually will). This type of contract, which also requires full disclosure of cost basis to the buyer, is called *Cost plus Fixed Fee*, and is used when neither buyer nor seller knows what problems may arise that change the direction and cost of the effort.

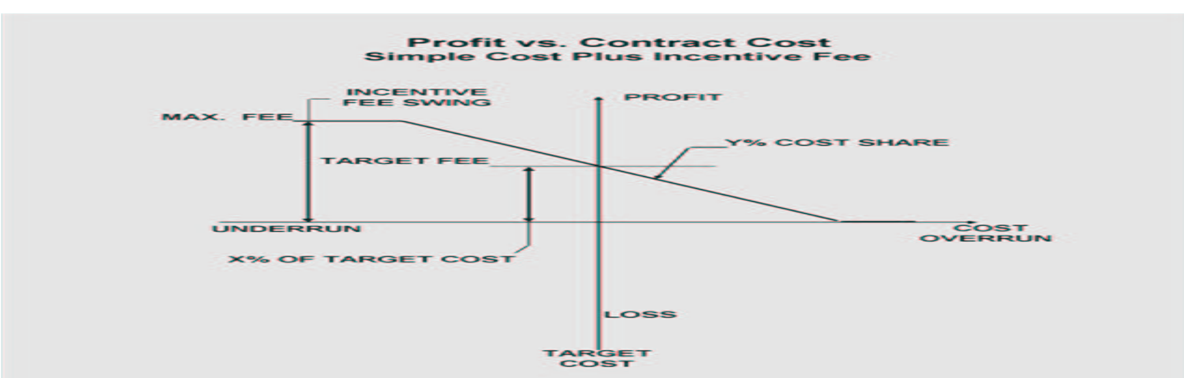
B. Specifying what you want to buy

CPFF contracts are not desirable if buyers know exactly what they want to buy. On the other hand, fixed price contracts are inappropriate unless what is being purchased has no uncertainties at all. If uncertainties do exist, fixed price contracts really are not fixed at all. If the buyers are going to own the rights to all data that comes out of a development effort, they should pay the seller's costs to do that job, so a cost reimbursable contract form is most appropriate. It is wise to create a contract that clearly delineates the requirements and objectives of the buyer for what is to be furnished. In doing so, a contract form is appropriate that incentivizes the seller to do what is necessary to exceed those requirements and meet the objectives. Properly done, the incentives dramatically affect the profit the seller can make depending on how well the requirements and objectives are met. These must be objectively defined and measurable. The following section describes some of those forms of contract.

12.3.4 More Complex Contract Forms Tailored to the Task and Risks to both Parties

A. Simple Form of Cost Plus Incentive Fee (CPIF)

Figure 12-2 shows an example of how a simple cost plus incentive fee contract works, where only cost is incentivized.



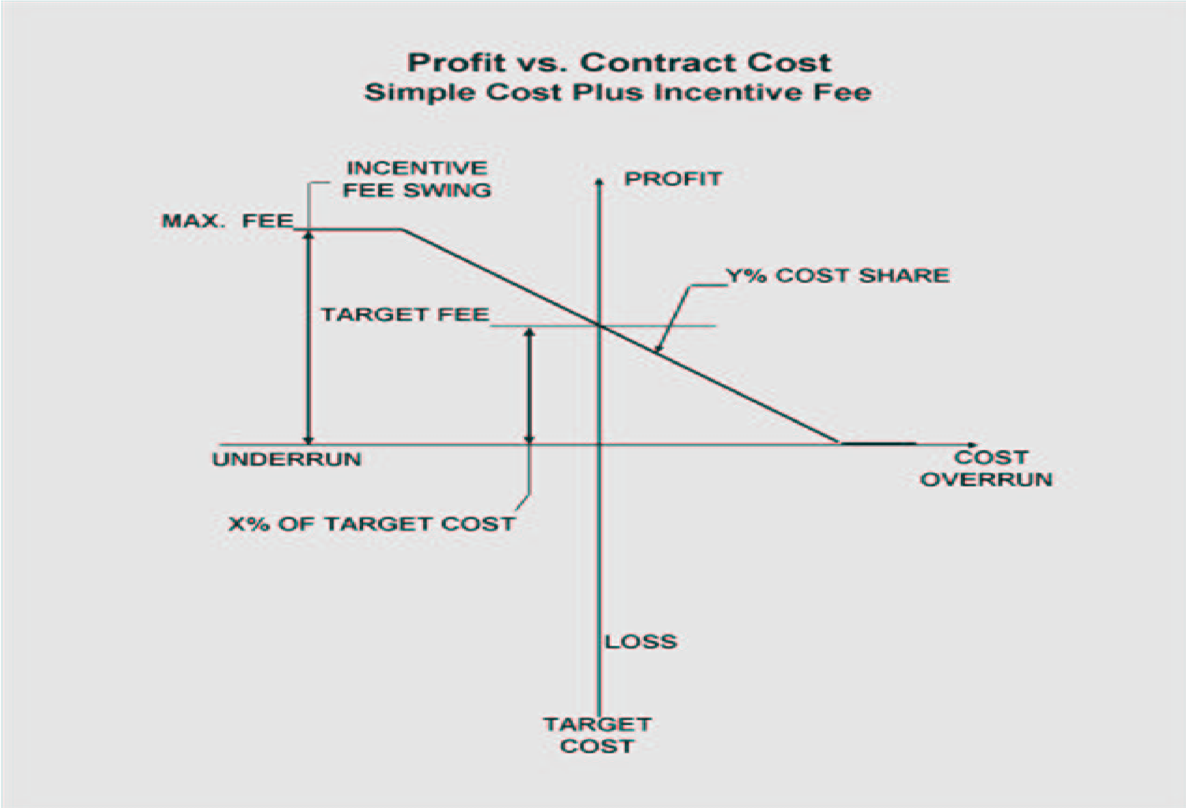
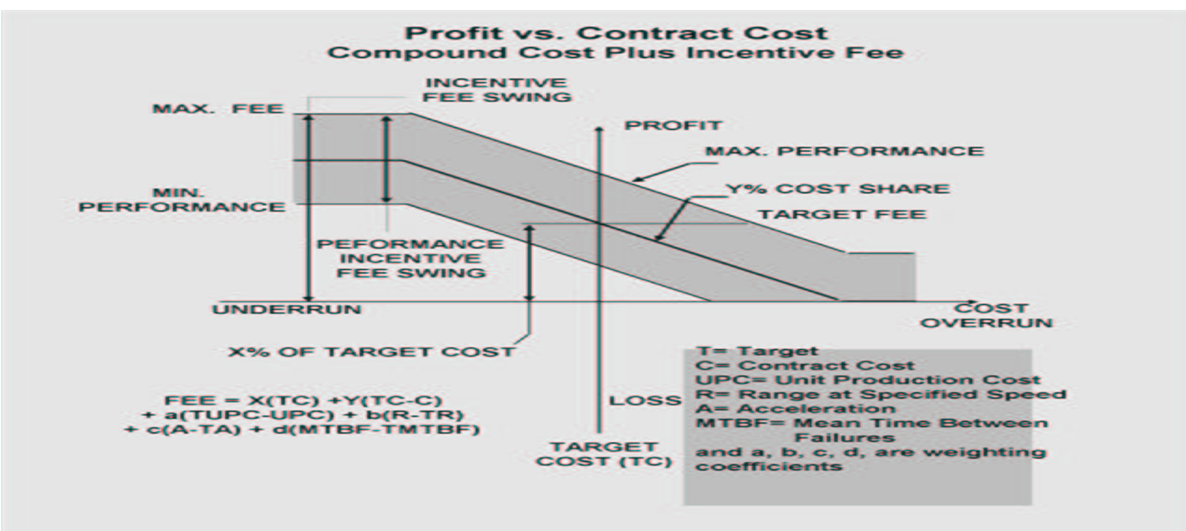


Figure 12-2 A Simple CPIF Cost Profit Relationship

The principle here is that while seller's costs are covered, profit ought to be a function of performance: An excellent job should yield an excellent profit; an average job should result in an average profit; A poor job should result in no profit. What is excellent and what is poor must be well defined. At target cost and target performance, (expected or average contract performance) the target fee, which is a percent of target cost, is earned. Since the contract is cost reimbursable, the buyer still has the liability for all cost once the minimum fee position has been reached.

B. Compound or Multiple Performance Incentives

The use of a CPIF form of contract with cost only incentives is a waste of a good tool. Multiple incentives provide the seller with guidance on the strategy for buyer satisfaction. In figure 12-3 we see an example of how a multiple incentive plan CPIF contract might work for the hybrid car example discussed earlier in this book.



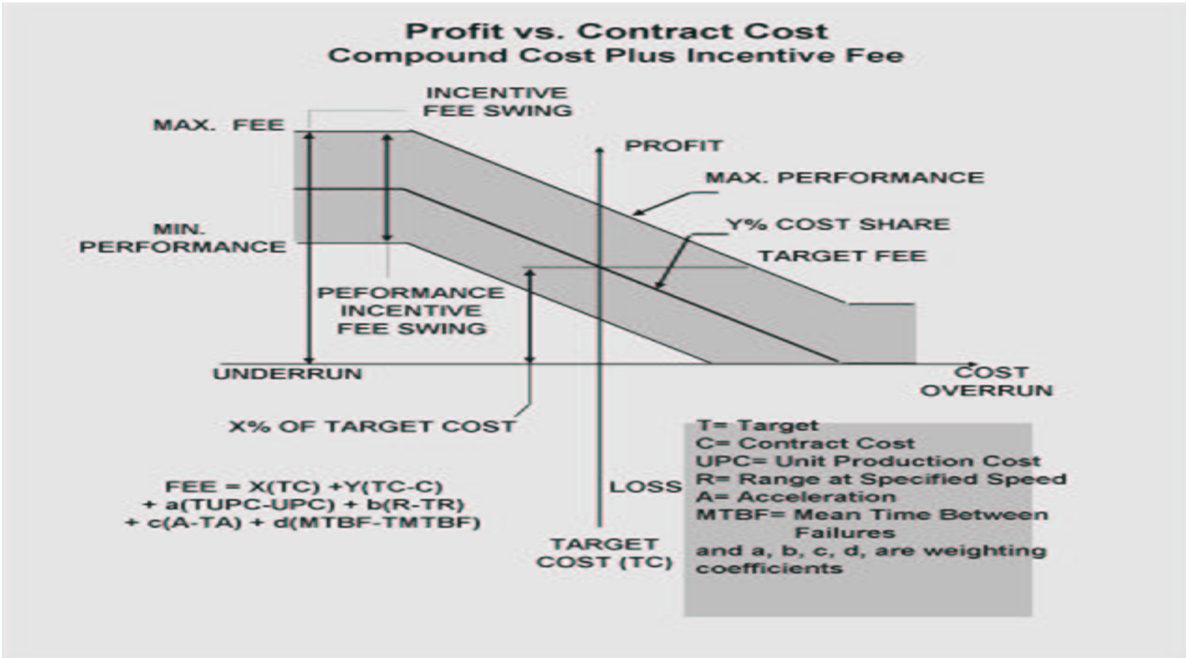


Figure 12-3 A Compound or Multiple Incentive CPIF

Cost Profit Relationship For a Hybrid Auto Development

Let's assume that the buyer is a state highway agency that wants to develop a viable hybrid auto for production that meets certain criteria. If the vehicle meets these criteria, the state will invest in the roadway and power utilities to implement the system. The key performance parameters are battery powered range at a specified speed, acceleration capability on batteries, average unit production cost of a pre-production sample of 50 vehicles, with a specified mean time between failures and an economical maintenance plan. Development cost is also important, but within limits, the buyer is willing to trade additional development cost to achieve a lower unit production cost and better vehicle performance. Schedule is only important insofar as it affects the state's next long range planning cycle, which will occur in four years. The state wants the 50 vehicles delivered three years from contract award so they can be tested for a year before the budget planning cycle starts.

We now have six or seven performance parameters that can be used to tell the contractor what it takes to maximize profit. Contract cost in this example is development cost plus the cost of pilot production. Unit Production Cost is the pilot production cost less any non-recurring cost divided by the 50 units delivered.

Development cost should be a fairly small fraction of the total incentive fee pool if the buyer wants the other performance objectives to be pursued. Performance in meeting or exceeding the requirements and achieving the objectives should form the majority of an incentive fee. The state agency must decide on some value statements about each of these performance parameters, both individually and relative to each other. It must also decide the minimum acceptable outcomes for each parameter, the target values, and also the maximum objective it will pay to achieve.

The target values may or may not be halfway between the minimum acceptable and the maximum desired values. What they actually should be is the expected outcome for target development cost. In principle, an equitable contract would result in the developer in the aggregate having as much opportunity to make maximum profit as to make none. In this case there is no advantage to the buyer to complete the contract deliveries early, but there is a strong disadvantage for being late, so the schedule incentive is penalty only.

The beauty of this contract form when properly definitized is that it forces both buyer and seller to think about the strategy to best achieve the desired outcome. It results in a real meeting of the minds.

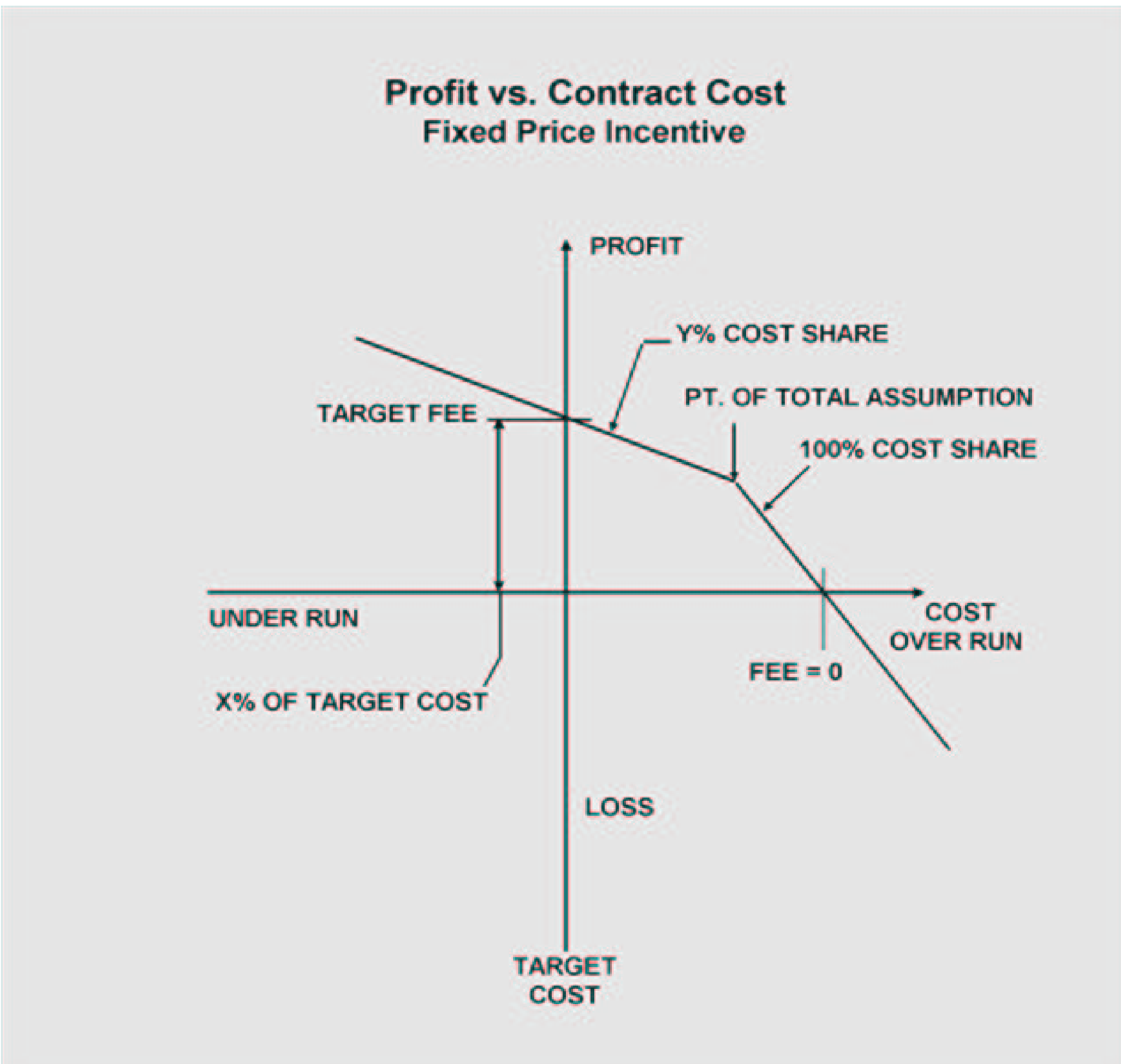
Once the contract is signed, the buyer must step back and let the seller do the job and try to maximize profit, guided by the incentive plan. Any direction by the buyers makes them liable for a constructive contract change. The seller must provide continuing visibility of accomplishment to the buyer and demonstrate compliance with the contract. Performance against the incentives must be measured objectively and dispassionately in accordance with the methods outlined in the contract. This approach instills a discipline on both buyer and seller from start to finish, that is very beneficial in almost all cases.

C. Cost Plus Award Fee (CPAF)

I have never been a fan of this contracting form, because it is very subjective, and encourages meddling and gaming by the buyer. Its proponents say that there are some things that cannot be measured by a dollar value such as human life in manned space programs; or, that what is important may change from one period to the next. What it really does is to remove all effective decision power from the seller, and makes the seller try to please the buyer to the maximum extent possible. If the buyer is capricious, and some are, the project can lose all coherence. There is no balance of power in this arrangement.

D. Fixed Price Incentive (FPI)

Figure 12-4 shows the cost/profit relationship for this FPI contract form. It is really a cross between a cost plus incentive fee and a firm fixed price contract. It differs from a CPIF form in that it has a point of total cost assumption by the seller. That is, at some cost above target, the cost share borne by the seller goes to 100%, and the buyer has no additional cost liability. Below that cost, multiple incentives can be employed similar to the compound CPIF example. But generally cost share by the seller is much higher than in a CPIF contract. This contract form makes sense when the product is well defined, but has some cost uncertainty and performance above some minimum threshold is desirable.



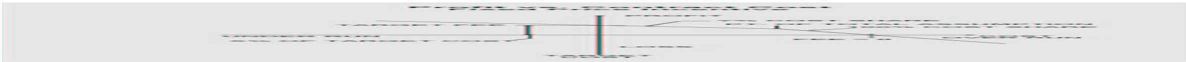


Figure 12-4 Fixed Price Incentive Contract

Cost Fee Relationship

It must be recognized that if the seller’s cost gets close to the point of total assumption, the seller should and will act as though the contract were FFP.

<u>E. Cost plus Incentive Fee with a Ceiling</u>

A CPIF contract with a ceiling is a hybrid wherein if the cost exceeds some value above target, the contractor assumes all additional cost just as in an FPI contract. Generally neither party expected to be there, and it is usually the result of a renegotiated CPIF contract that has run into major difficulty.

12.4 Important Tests for Choosing the Right Contract Form

We can summarize some simple tests for the applicability of any contract form. They are applicable whether you are a buyer or seller.

A. If you know exactly what you want and can buy it out of a catalog, a fixed price purchase agreement will be fine provided you have a way to verify that you got what you paid for.

B. A product isn’t off the shelf if it isn’t in stock or currently in production. The restart of an old production line creates risks in process replication, and requires proof that the production yields the same product. In short, this situation is not a good candidate for a fixed-price contract-from the buyer’s or seller’s perspective.

C. If development is required, the seller should not offer it for a fixed price if the buyer is going to have ownership of the design. There is no such thing as fixed price development. Someone is going to have to pay the piper in the event of unforeseen problems. The seller would be justified in covering any development overrun if retaining rights to the product design would allow the seller to recoup those losses in other markets. Even then, the seller should make sure that his or her bosses know that they may have to pony up additional funds to complete the job. Doing it for customer good will is generally unwise because good will has a way of dissipating as in "What have you done for me lately?"

D. A buyer who buys fixed price and makes even the smallest change will pay dearly for the change, which will have a high profit margin because of the seller’s risk. So a fixed price contract won’t limit a buyer’s liability unless the requirements stay fixed. Even then there is no guarantee. (See the L1011 example)

E. A Cost plus incentive fee contract offers by far the highest integrity method of contracting for anything that requires significant development effort in which the buyer will have primary rights.

F. If neither buyer or seller knows what is needed without substantial design iteration, a CPFF contract makes the most sense, but it should be conducted with the discipline of a CPIF contract to the maximum extent possible, with a written trail for all changes. Buyers often abuse this type of contract, and the seller often lets them. One good approach is to start with the more fluid CPFF contract and then convert it to a more rigorous form when the uncertainties have been resolved.

G. Never use a cost plus percent of cost contract for anything.

12.5 The Dangers of Non-linearities in Cost-Fee Relationships

A few observations on non-linearities in incentivized contracts are worthwhile before leaving the subject of contract forms. Non-linearities such as the break point at the point of total assumption in an FPI contract, or dead bands around cost targets, cost-share ratio changes, or other performance parameter functions, have their place in tailoring a contracting plan. But they can result in undesired behavior depending on where the buyer and seller find themselves later in time. If you choose to use such elegant finery, be sure to conduct simulations and role playing to avoid counterproductive incentives.

12.6 What if the Contract Becomes Inoperable?

Contracts are not chiseled in stone. There are times when the best laid plans and contracts encounter a problem where the contract tells the seller to do something that has been overtaken by events, which if continued would be counterproductive. This happens. Remember the pre-amble to the contract I mentioned earlier? Don’t ever be afraid to propose changing a contract that for some reason has become dysfunctional in the context of current events.

12.7 Your Signature is Your Bond

> *NEVER SIGN ANYTHING THAT YOU HAVEN’T READ AND **UNDERSTOOD**.*

This is as important in your private life as in your professional life. I had a boss who once told me, "You can sign for me on any document or commitment until you screw up. If you do, you will no longer even be allowed to sign your own name." A true vote of confidence, but with a sobering admonition. I got the point.

Your signature means something. In a high integrity environment it means everything. It says you have made a commitment about the validity of what you signed.

Whether you’re signing a contract, a requirements specification, a personal loan or an insurance policy, read all of the fine print. Someone put it there for a reason. If you are authoring or approving a document, and you or someone else cannot understand what it says, it probably isn’t a good document.

References

8. *Beyond the Horizons - The Lockheed Story* Walter J. Boyne, St. Martin’s Press, 1998 p.357

9. *A Plane That Never Was Could Still Cost Us a Bundle* Philip Dine, St. Louis Post Dispatch, March 8, 1998
