Management Services: A Magazine of Planning, Systems, and Controls

Volume 4 | Number 4 Article 3

7-1967

Controlling Return on Investment With Government Contracts

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In today's environment, as contrasted with the old days of "cost-plus" government contracts, a controller owes his company the strictest scrutiny of investment requirements for every government contract. Here are three essentials of a program for —

CONTROLLING RETURN ON INVESTMENT IN GOVERNMENT CONTRACTS

by Robert L. Lenington
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MANY controllers feel that their responsibility for control of government contracts is limited to providing management with information on actual spending as compared to a plan or standard. Control of spending, however, is not enough. The ultimate measurement of business performance is the profit that can be generated against a level of investment. The controller's responsibility, therefore, should also include the development of procedures to regulate the cash flow that determines the investment requirements for performing on a U.S. government contract.

This article presents the basic concepts of a system for controlling contract investment. The techniques and procedures outlined here have been in effect in our electronic systems division since early 1966. The visibility and control they provide have enabled us to reduce our investment requirements significantly. (The Sylvania system is computerized, but the computer application is not included in this discussion, which emphasizes the concepts involved.)

Although the control techniques and disciplines described are applicable to any business, the primary emphasis in this article is on controlling investment in a government contract environment. First, the article develops a technique for measuring contract performance trends that can be applied to any type of effort. Then it outlines a comprehensive management report for highlighting problem areas and assigning responsibility for resolving them. Finally, it reviews the functions in a company's operation that should be monitored continually to assure

What is Contract Investment?

		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	5th Qtr.	6th Qtr.	Total
Beginning Balance		$ —	$ 120	$ 360	$ 600	$ 490	$ (50)	$ —
Spending								
Material		200	400	400	100	—	—	1,100
Labor		100	200	200	100	100	—	700
Indirect Cost		100	200	200	100	100	—	700
Sub-Total		$ 400	$ 800	$ 800	$ 300	$ 200	$ —	$ 2,500
Collection								
Progress Billings	(70%)	$(280)	$(560)	$(560)	$(210)	$ (140)	$ —	$(1,750)
Acceptance	(30%)	—	—	—	(150)	(450)	(150)	(750)
Profit	(10%)	—	—	—	(50)	(150)	(50)	(250)
Sub-Total		$(280)	$(560)	$(560)	$(410)	$ (740)	$(200)	$(2,750)
Ending Balance		$ 120	$ 360	$ 600	$ 490	$ (50)	$(250)	$ —
Average Investment		$ 60	$ 240	$ 480	$ 545	$ 220	$(150)	$ 230
Customer Acceptance					$ 550	$1,650	$ 550	$ 2,750

EXHIBIT I

that investment is minimized. Attention to these three areas of investment control should assure maximum performance against a minimum investment.

Investment

The term investment as used in this article refers only to contract investment, i.e., those expenses and costs generated in the actual design or fabrication of the hardware. The premise that the contractor has facilities and equipment available for performance of the contract is inherent in the bid and subsequent award of a contract. Assets other than the contract product, such as buildings, cash, equipment, etc., usually are not controllable by the project managers and other personnel directly responsible for contract performance and are not readily allocable to the various in-house contracts. These assets are controlled through other techniques, which are not covered in this article.

A controller has two responsibilities toward investment. He must establish procedures and controls that will assure maximum turnover of capital, and he must develop techniques for accurately measuring the profit return on investment. In commercial business both these responsibilities are widely accepted, although a number of problems still remain in carrying them out, and many articles and textbooks have been written about them. Relatively little has been published about investment control in government business.

There are good reasons for the past failure to develop proper investment measurements for government business. The typical defense business has been made up of contracts that covered varying periods of time, were negotiated with varying payment terms, and were accounted for under different accounting systems (for example, sale and profit declaration based on shipments versus sale and profit based on percentage of accomplishment). This lack of uniformity even within a company has made it difficult to develop a method of measuring investment.

Another deterrent was the absence of incentive. Formerly most government business was conducted under cost-plus contracts, which provided for full recovery of investment almost immediately upon expenditure through continuous collection of total cost and associated profit. These arrangements gave the contractor little direct incentive to monitor expenditures strictly. The customer (the government) was unable to specify precise requirements, and the contractor was more interested in solving technical problems than in worrying about cost control in an environment in which a profit was guaranteed and all costs were reimbursed in full as incurred.

Today, however, government-funded industry is operating in a new and tighter profit environment, with restrictions on costs, profits, investments, etc. Under a fixed-price type of contract, collection of incurred cost is limited to a progress billing percentage, usually 70 per cent, with the remaining 30 per cent of cost and all the profit to be collected at the time of completion of effort or shipment of product. To offset this restriction of investment turnover and to provide

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motivation in a risk environment with ceilings on spending and recovery, the government increased profit percentages. Thus, proper control of investment has become more urgent than before.

Performance measurement

To be universally acceptable and comparable from contract to contract and company to company, a technique for the measurement of contract performance must have certain characteristics:

1. It must provide for measurement of contracts covering any length of time and for any amount of money.
2. It must be applicable to both fixed-price and cost-type contracts.
3. All measurements must be converted to and interpreted on an annual basis since investment measurement in any industry is expressed in terms of an annual profit realized on an average investment.
4. It should work under any accounting system—percentage completion, sales/shipment, or other. If some method of accounting other than percentage completion is utilized, profit will have to be calculated as a function of cost incurred rather than cost declared on a shipment basis.

Unless the technique meets all these standards, it cannot be used effectively to compare a given contract with others within a company or with those of other companies. Comparison of other common factors such as sales, profit, and investment levels will be misleading unless the ultimate measurement of profit earned on money invested is available and dependable.

A unique feature of government business is that the investment requirements are negotiated rather than planned and analyzed as they are in a commercial business. A commercial business does not attempt a new product until a financial analysis has been prepared considering such factors as market penetration, breakeven analysis, investment requirements, and profit return. If the financial analysis does not indicate an acceptable profit return on investment, the endeavor is not attempted. In government business, however, a contractor is frequently selected on proposed price, with the investment implications determined only during negotiations.

Our measuring technique starts upon completion of negotiations. We will develop a trend line outlining our goals on contract performance based on all investment aspects as negotiated. The entire procedure for development of this technique will be illustrated by means of a hypothetical example.

The first factor we must define and develop is our investment base, which, as mentioned previously, is contract investment only. Its development is shown in Exhibit 1 on page 22.

The next step in our procedure is to calculate the profit that will be earned on this investment. Profit in this case is the profit that will be earned after all costs, including general and administrative expenses, are considered, but before federal income taxes. For our purpose, profit will be determined and measured on two bases:

1. The basic figure will be the profit that was originally negotiated with the customer, adjusted periodically for the effect of changes imposed on the contract during its life. This measurement will provide a profit performance at target, which, for the purpose of this procedure, is a goal.
2. In the course of actual performance, two separate measurements will be made for comparison with the goal. One calculation will be based on the target profit as negotiated. A second calculation will be made based on expected profit after considering indicated overrun or underrun. The second measurement will indicate the degree of improvement or loss realized on cost performance when it is compared to the first measurement at target.

Profit, as earned on a monthly basis, will be determined by ap-

EXHIBIT 2

What is Profit for Measurement?

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	5th Qtr.	6th Qtr.	Total
Investment							
Beginning	$ 0	$ 120	$ 360	$ 600	$ 490	$ (50)	
Ending	120	360	600	490	(50)	(250)	
Average	$ 60	$ 240	$ 480	$ 545	$ 220	$ 150	$ 230
Cumulative Cost	$400	$1,200	$2,000	$2,300	$ 2,500	$ 2,500	$ 2,500
Profit @ 10%	$ 40	$ 120	$ 200	$ 230	$ 250	$ 250	$ 250

$$\text{Formula: } \frac{\text{Annualized Profit to Date}}{\text{Average Investment to Date}} = \text{Profit as a Percentage of Investment}$$

$$\frac{(\$250 \div 6) \times 4}{\$230} = \frac{\$166}{\$230} = 72\%$$

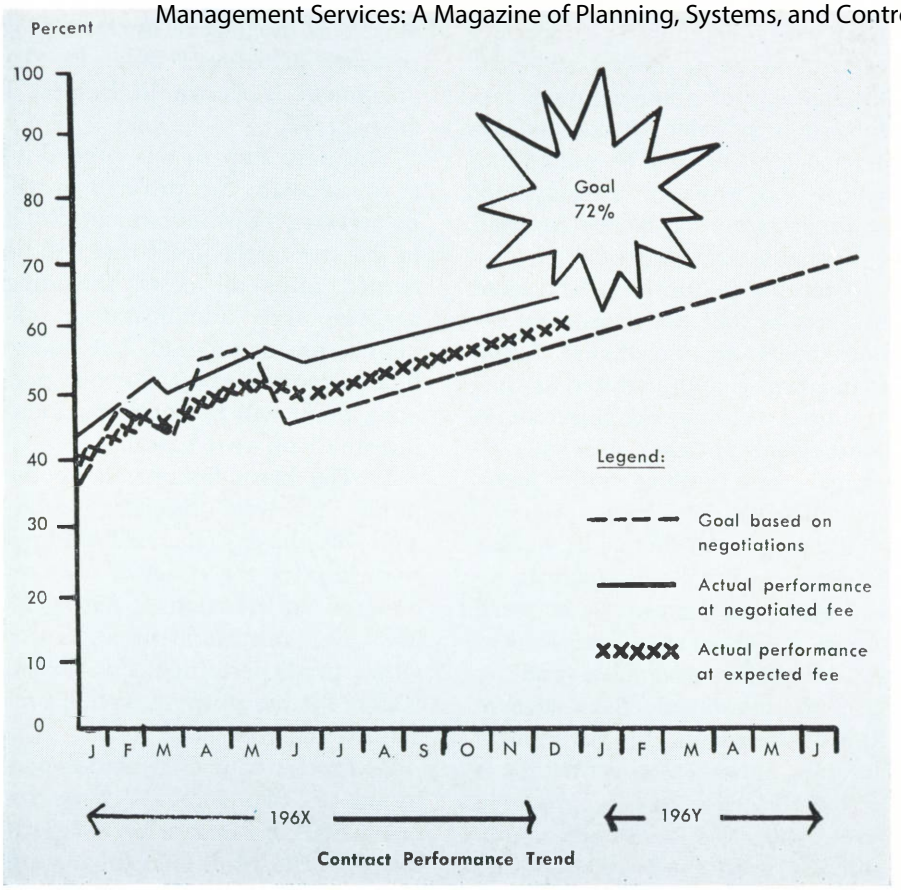


EXHIBIT 3

plying target profit percentage and expected profit percentage against those costs that are incurred and accumulated in investment. This will assure that profit earned is in line with the cost activity incurred in performance of the contract. Derivation of the profit for measurement is shown in Exhibit 2 on page 23 along with the formula used for calculating profit as a percentage of investment.

The investment figures developed in Exhibit 1 are utilized. The average investment in this example is $230 against a total cost input of $2,500 for the 18-month period. With 10 per cent earnings for the period, we show a $250 profit. Profit to date is annualized by dividing the $250 by six for the six quarters to develop the average quarterly rate and multiplying this figure by four to develop an annualized profit of $166. The $166 is then divided by the average investment of $230 to show the profit percentage of investment, 72 per cent.

A 72 per cent profit as a percentage of investment may appear high; remember, however, that profit at this level is before disallowances and taxes and that investment does not include facilities, liabilities, etc. In a business with many in-house contracts, there are contracts that lose or, at best, break even on profit and thus cut overall performance down to approximately one-half of that which can be realized on one well performed contract.

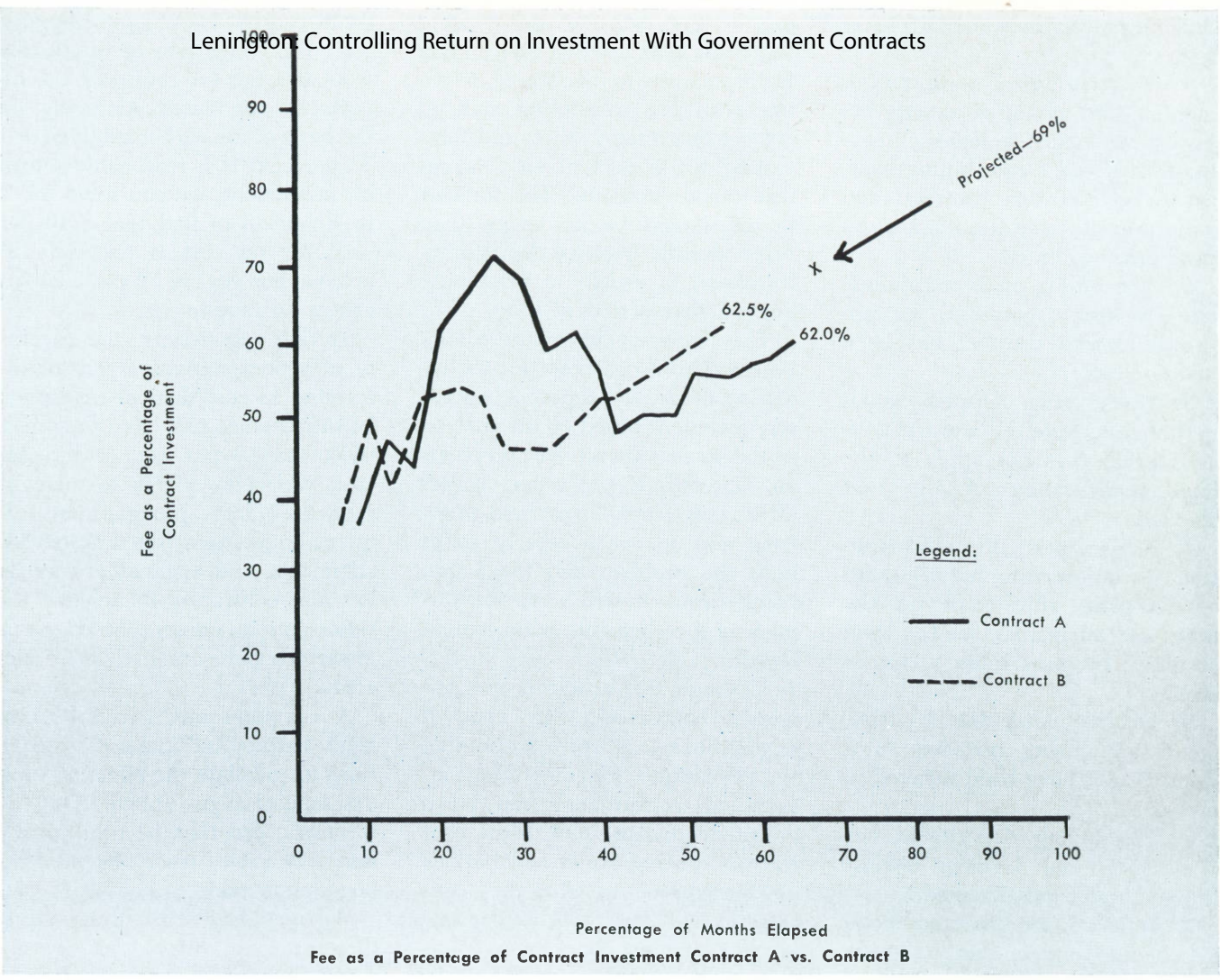
Return on investment must be expressed in terms of an annual consideration. Annualization is accomplished by developing equivalent fee earned for a twelve-month period on an investment that represents an average for the period of performance. A six-month contract earning $120 for an average investment of $500 will provide an annualized profit of $240 and a return of 48 per cent. A twelve-month contract with an average investment of $500 and earnings of $120 shows a return of 24 per cent.

The investment calculation is very sensitive to weighting. Ideally, investment is an average of the daily amount tied up; however, for the purposes of this technique, a simple weighting of beginning and ending balances for the month is sufficient. This, in effect, means that a ten-month-period average would be derived by dividing beginning and ending balances for the ten-month total by twenty.

The end result of our procedure is a series of monthly plot points expressed as percentages. The plot points shown in Exhibit 3 on this page are not developed from the preceding exhibits. The figures in preceding exhibits were completely hypothetical; their purpose was to highlight the mathematics required to support the measurement technique. Exhibit 3 is based on curves developed from actual performance on contracts as measured at Sylvania Electronic Systems.

The dash line is a goal calculated immediately after negotiations based on all investment implications as negotiated. The solid line shows actual performance at target profit percentage. The cross-hatched line is a recalculation of actual performance utilizing expected profit earnings based on the latest cost to complete. In this example, the latest cost to complete shows that the contract will be overrun; however, since actual performance at expected profit, although less than actual at target, is in excess of the goal negotiated, investment on this contract is well controlled in spite of the higher costs incurred on the overrun.

The percentages are relatively high in the beginning of the contract before the heavy accumulation of the 30 per cent retention on cost prior to shipment takes effect. The percentage drops as the retained cost accumulates and then starts a slow upswing as shipments commence, the 30 per cent retained cost associated with the shipments is liquidated, and fees are collected. The percentage gains momentum as shipments accumulate and cost input drops off toward the end of the contract. The final per-



Fee as a Percentage of Contract Investment Contract A vs. Contract B

EXHIBIT 4

centage is the profit as a percentage of investment realized on performance over the entire life of the contract expressed in terms of a weighted annual return completely comparable to any other contract's performance measured with the same technique.

Exhibit 4 on this page shows the method of presenting a comparative analysis of two contracts. An absolute comparison cannot be made on an overlay because of the varying lengths of the contracts and the difference in percentage of completion between them. These variances can be made directly comparable to each other by converting the horizontal axis to a percentage of completion rather than a monthly time axis. The final comparison is made by extrapolating the contract that has less elapsed time via a plot point in time equal to the most recent plot point of the other contract. This will give a true picture of how the contracts currently compare with each other.

The technique outlined in this article for performance measurement can form the basis of a vigorous investment control program. This measurement procedure will highlight performance on all contracts against their own goals, provide for comparisons among the various contracts, and help to identify those contracts that are in trouble and/or show a trend that will put them in a poor position. The procedure provides management with visibility for a quick reference on all business.

Management investment report

At least monthly, management should receive a comprehensive investment report containing performance measurement graphs. This report should be prepared by a financial analyst who is thoroughly familiar with the accounting system and organization. His report should start with a dollarized recapitulation of all problems involving the excessive investment of company funds. He should identify the individual responsible and outline what action the party is taking or will take to correct the situation. Succeeding reports should always follow up on these corrective actions.

Excess investment problems cover a wide spectrum of business activities. The problems are created by individuals who are not taking advantage of legitimate contractual investment reliefs, whether negotiated or unnegotiated. The areas to be monitored in order to avoid excess investment will be identified later. However, the areas of major

difficulties can be summarized as follows:

1. Negotiation of a contract is lagging, and money is already being spent against a letter of contract. This will create billing limitations on cost-type contracts and will prevent sale/liquidation on fixed-price contracts.
2. The billing price schedule is late in being submitted for approval after a contract has been made definite.
3. Units being shipped cannot be billed because the latest negotiated price does not apply to the final configuration of the unit shipped.
4. A fixed-price incentive contract is in overrun, requiring increased-price adjustment on the units and an increase of the level at which progress billings can be applied.
5. Defense Department documents authorizing invoicing of a shipped unit have been delayed in process.
6. The billing department has a backlog, and invoices against shipped units are detained.
7. Materials are procured ahead of schedule, and/or finished goods are completed ahead of schedule.
8. A contract is completed, and the organization is delinquent in completing close-out requirements for final billing submission.

The management performance report can be further improved by incorporating forecast information on the performance measurement graphs. This can be done by using the latest sales forecast information for input costs to investment, working with the scheduling staff to project investment relief, and forecasting the impact of any current investment problems. The forecast period should be no longer than three months because detailed information is usually not accurate beyond that period of time.

The management report cannot be standardized. Except for the recap schedule, the report is a written document based on an analysis of the various investment problems encountered. If the report covers all current excess investment problems and for each clearly states both the problem and the action being taken, it will serve its purpose as a responsible management report.

Although this article is not primarily concerned with contract negotiations, it is worth noting that this technique for measuring investment performance can be a useful negotiating tool. Most contractors concentrate in negotiations on development of what they consider to be a fair profit percentage on cost without concerning themselves as to what is a fair profit based on the investment negotiated. Investment as negotiated can be used as a lever for negotiating a fair profit based on that investment; therefore, profit should be left as a final element in negotiations.

Exhibit 5 on this page shows how profit can be "backed into" by utilizing the techniques of calculating what is a fair fee return on the investment negotiated. Assuming, on the basis of the earlier exhibits, that 72 per cent is a reasonable return on investment, we can solve for X in Exhibit 5 to find that a 10 per cent fee on cost is necessary to achieve our goal of 72 per cent fee return on investment.

During negotiations, the government representatives are more interested in cost than in cash flow. In the instance just cited they may object to 10 per cent additional cost; they may prefer to increase progress billings, provide more frequent liquidations based on partial shipments, or in some other way allow the contractor to achieve his return on investment based on a lower fee percentage than 10 per cent.

A computer model can be utilized before and during negotiations to calculate the effect of various aspects of investment. This information can then be used to obtain favorable trade-offs at the negotiating table.

We now have two prongs of a three-pronged attack on investment: the means of measuring performance and the development of a comprehensive investment report to identify specific investment problems, responsible individuals, and the actions necessary to correct the problems. The third step is to outline a program for continual monitoring of all areas affecting investment.

EXHIBIT 5

How to Calculate Expected Fee Percentage from Expected Investment Levels

$$\frac{\text{Cost} \times \text{Fee Percentage}}{\text{Number of Months in Contract Life}} \times 12 \text{ Months} = \text{Expected Fee as Percentage of Investment}$$

$$\text{Average Investment in Contract Life}$$

$$\frac{\frac{\$2{,}500X}{18} \times 12}{\$230} = 72\%$$

$$\frac{\$1{,}667X}{\$230} = 72\%$$

$$7.2X = 72\%$$

$$X = 10\%$$

Monitoring investment

The most effective way to reduce investment is to concentrate attention on the items that affect cash flow and to identify the persons responsible for resolving problems arising out of these items. After all, in its simplest form, control is the identification of a responsible individual and the application of pressure to that person to reduce spending and/or improve cash flow.

In government business, invest-

ment control requires the following by customer and contractor and actions in order of occurrence:

During negotiations:

1. Request the maximum progress payment percentage.
2. Request an advance payment (partial sale) arrangement if the build-up of a unit covers an exceptionally long period of time.
3. Request sale/liquidation for all identifiable accomplishments (such as the preliminary design review, critical design review, engineering releases, etc.) in addition to the usual hardware items.
4. Request a sale/liquidation percentage that provides for full collection of both cost and negotiated fee percentage. Exhibit 6 on this page shows how collections are restricted if the contractor accepts the standard sale/liquidation rate of 65.3 per cent prescribed by government regulations, which is developed from a contract with a fee of only 7.1 per cent. A different sale/liquidation rate should be requested as a contractual agreement if the negotiated fee is in excess of 7.1 per cent.

As can be seen in the exhibit, use of a liquidation rate developed from the negotiated fee (70% ÷ [100% + 9.5%] = 63.9%) provides for full cost recovery during the performance period of the contract. Use of the standard 65.3 per cent method will allow a cost of $15 ($395 less $380) to accumulate in investment until the contract is closed and final collection is received.

5. Use expected investment, developed from negotiated cost, shipment schedule, progress billings relief, and sale/liquidation arrangement (as outlined earlier in the article), to negotiate a profit percentage that will provide a fair profit return on investment.

After negotiation:

Immediately prepare a priced unit billing schedule to be attached to the contract. This action will assure authorization for sale/liquidation arrangements concurrent with signature approval of the contract and prevent any delays associated with soliciting later approval of the schedule.

Continual effort:

1. Cost control is the most important area for close surveillance if a sound investment program is to be maintained. Cost control has a double effect on performance measurement. If costs are controlled, investment will be lower because lower costs will be incurred, and accumulated and profit earnings will be correspondingly greater.
2. Evaluate existing procedures for preparing make or buy analyses to make sure that trade-off decisions are based on investment return considerations in addition to cost considerations, recoverability, and value of money.
3. Evaluate procedures for analyzing quantity discount procurements. These procedures should consider the value of money on advance procurement, storage cost, the risk associated with a contract termination, and the risk that engineering changes will alter or eliminate a particular material.
4. Review and analyze manufacturing procedures for lead time on the procurement of raw materials and component parts. Monitor their schedules to avoid building up units ahead of the shipping schedule.
5. Study the movement of all documents that affect investment. This study should include analysis of time lapse statistics on the flow of documents between organizations. The persons responsible for processing the paperwork should be monitored to assure that they are receiving all the necessary documents and receiving them on time. Paperwork backlogs can build up if a group, such as the billing department, is not receiving proper documentation and is not aware that it should be receiving certain documents for a given contract.
6. Evaluate existing procedures for updating billing prices whether the update is required by a contract change and/or by recalculation of an interim billing setup. Develop procedures for monitoring the time lapse of all items affecting a billing schedule such as negotiation dates, financial pricing of billing schedule dates, the contract department's response to the customer, receipt of the supplemental agreement from the customer, and presentation of adjusted billings to the customer for collection.
7. Monitor the billing department to assure that it is operating at maximum efficiency. Evaluate procedures for collection of billings as submitted to the customer to assure operating efficiency.
8. Evaluate contract close-out procedures to assure that final billings can be made as soon as possible.

Close attention to these major problem areas affecting contract investment and proper measurement and control will significantly reduce a contractor's investment requirements. Profit return on investment is a management measurement criterion more widely used each year. Some companies are already switching from the old profit center concept to "investment centers."

Collections at Different Liquidation Rates

Assumption	Cost		$1,000
	Fee @ 9.5%		95
	Sale		$1,095
Standard Method (Based on Average 7.1% Fee)			
(65.3%)			
Progress Collection			$ 700
Liquidation:	Retained	300	
	Profit	80	380
	Total Collection		$1,080
$1,095 − (65.3% × $1,095) =			$ 380
Expected Method (Based on Negotiated 9.5% Fee)			
(63.9%)			
Progress Collection			$ 700
Liquidation:	Retained	300	
	Profit	95	395
	Total Collection		$1,095
$1,095 − (63.9% × $1,095) =			$ 395

EXHIBIT 6