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FINAL

AWARD FEE INFLUENCE ON DTUPC

by

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The pronouns "he," "his," and "him," when used in this publication, represent both the masculine and feminine genders unless otherwise specifically stated.

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EXECUTIVE SUMMARY

- A. BACKGROUND. Design to Cost (DTC) is a management concept wherein explicit cost goals are set during development. In a development contract DTC is implemented through a Design to Unit Production Cost (DTUPC) provision to insure the contractor controls costs. Since 1976 the US Army Materiel Development and Readiness Command (DARCOM) has required the application of award fee to DTUPC achievements on those programs with only one development contractor when the award fee can be expected to generate significant rewards or penalties. It was determined that adequate data existed to analyze the extent to which award fee influenced DTUPC achievements.
- B. OBJECTIVES. The study objectives are to determine the extent to which award fee is used in conjunction with DTUPC and influences achievement or betterment of the DTUPC goal. Another objective is to recommend necessary changes to current policy for the application of award fee to DTUPC provisions.
- C. STUDY APPROACH. DARCOM Major Subordinate Commands (MSC's) were surveyed to obtain data on contracts with DTUPC to which award fee was and was not applied. The data was used to test the hypothesis that achievement or betterment of the DTUPC goal is independent of award fee. Contracting, technical and other personnel at DARCOM MSC's were interviewed on the influence of award fee and other factors on DTUPC achievements. Analysis of all data resulted in proposed changes to current policy for the use of award fee applied to DTUPC contract provisions.
- D. SUMMARY AND RECOMMENDATIONS. Generally, the policy for the use of DTUPC and award fees is adequately expressed in applicable regulations. Award fee has a statistically significant influence on DTUPC achievement and it can influence DTUPC achievement if the right factors are present. The factors include well-defined DTUPC, realistic adjustment factors, data requirements, evaluation criteria and weighting, determinations and award fee pool and distribution. Other factors are management emphasis and effective contract performance and administration. Recommendations include policy changes to enhance the effectiveness of DTUPC and incentives, including award fee, for motivation of contractors to meet or beat DTUPC goals.



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CHAPTER I
INTRODUCTION

A. BACKGROUND.

Design to Cost (DTC) is a management concept wherein explicit cost goals are set during development. The control of systems costs (acquisition, operating, and support) to these goals is achieved by practical trade-offs between operational capability, performance, cost, and schedules. Cost, as a key design factor, is reviewed on a continuing basis and as an inherent part of the development and production process. DTC goals are required when materiel is in Demonstration and Validation, Full Scale Engineering Development, Operational Systems Development, or under consideration for product improvement where production is expected to exceed \$10,000,000.¹ Prior to 1980 DTC was applied when production was expected to exceed \$4,000,000.

In a development contract DTC is implemented through the use of a contractual provision to insure that the contractor controls costs. The contractual provision is the Design to Unit Production Cost (DTUPC) goal. In addition, it has been the policy of the US Army Materiel Research and Development Command (DARCOM) to include award fees, applied to achievement or betterment of the average production unit cost ceiling, in certain contracts with DTUPC provisions. DTUPC contracts which require award fees are on those programs with only one development contractor when the award fee incentive can be expected to generate significant rewards or penalties. DARCOM Major Subordinate Commands (MSC's) have suspected that award fees have not been effective in motivating contractors to achieve the DTUPC.

¹ US Department of the Army, Army Regulation No. 70-64, "Design to Cost," para. 1-6, page 1-1, and Appendix A, page A-1 and A-2, 1 January 1980.

To date there has been no assessment of how much the award fee provision has influenced DTUPC achievement. A survey conducted in mid-1979 showed the DTUPC award fee data base was inadequate for valid analysis. A Spring 1982 survey indicated that a sufficient data base was available.

An additional impetus to this study is Carlucci Initiative Number 22, "Design to Cost Goals." The Carlucci Initiative has as its purpose tying fee awards to actual costs achieved during the early production runs. APRO research will also provide data for two of the objectives established by a DARCOM Task Force which has the responsibility for the Army implementation of DOD (Carlucci) guidance on Design to Cost. The two objectives are to: (1) review and evaluate existing DARCOM DTC policy; and (2) analyze DTC data available on past and present systems.

B. OBJECTIVES.

1. Determine the extent to which award fee is used in conjunction with DTUPC requirements.
2. Determine the extent to which award fee influences achievement or betterment of the DTUPC goal.
3. Recommend any necessary changes to current policy for the application of award fee to DTUPC contract provisions.

C. STUDY APPROACH.

1. The DARCOM Major Subordinate Commands (MSC's) were surveyed to obtain data on contracts with DTUPC with and without award fee applications.
2. Literature on DTC and award fee was reviewed to determine compatibility of conditions for application.
3. An analysis was made of DTUPC achievements in contracts with and without award fee.

4. The data was used to test the hypothesis that achievement or betterment of the DTUPC goal is independent of award fee.

5. Contracting, technical and other personnel at the DARCOM MSC's familiar with these contracts were interviewed on the influence of award fee or other factors (contractual or noncontractual) on achievement or betterment of the DTUPC goal. The fact that award fees are determined subjectively and unilaterally by the Government led to this approach.

6. As a result of the analysis, proposed changes to current policy were developed for the use of award fee applied to DTUPC contract provisions.

D. REPORT ORGANIZATION.

Chapter II gives a brief overview of DTC, DTUPC and award fee. Analysis of DTUPC achievements on completed contracts with and without award fee applications is provided in Chapter III. Chapter IV contains rationale for the nonapplication of award fee to DTUPC and reasons for deletion of DTUPC's, award fees on DTUPC's or both after award of the basic contract.

Factors that affect the success of DTUPC and award fees are discussed in Chapter V. Other issues associated with DTUPC and award fee are given in Chapter VI. Conclusions and recommendations are presented in Chapter VII.

CHAPTER II

BACKGROUND

A. INTRODUCTION.

The acquisition community is at least generally familiar with the terms Design to Cost (DTC), Design to Unit Production Cost (DTUPC), and award fee. But they may not be cognizant of all the specific objectives, policies, and procedures which are necessary for an understanding of the discussion in subsequent chapters. To assure that all readers are aware of the basics on which the study is premised, a brief review follows.

B. DESIGN TO COST (DTC).

The following information is extracted from AR 70-64.

1. The objectives of DTC are twofold:

a. Establishment of cost as a factor equal in importance with technical requirements and schedules throughout the design, development, production, operation and support of weapon systems, subsystems, and components.

b. Establishment of cost elements as management goals for acquisition managers and contractors. This will insure the best balance between life cycle cost, acceptable performance bands, and schedule.

2. The following are guidelines for applying DTC concepts.

a. During design and development, cost requirements and cost effectiveness goals shall be evaluated with the same rigor as technical requirements and performance goals. Regularly practical trade-offs shall be considered between the materiel capability, cost, and schedules. This will insure that the materiel developed will have the lowest life cycle cost consistent with schedule and performance requirements.

b. The recommended DTC goals should be achievable ones that challenge designers, engineers, and project/program managers to their best efforts.

c. Identification and specification of DTC goals and thresholds must be clear, complete, measurable, and valid. The composition of each DTC goal must be plainly understood by decisionmakers, middle management, program/project/product managers, and contractors.

d. Army DTC goals and thresholds are set upon entry into Full-Scale Engineering Development. Both goals and thresholds will be set so that progress can be traced, measured, and verified throughout the materiel acquisition cycle.

e. DTC principles and targets should be included, with measurable targets for Operations and Support (O&S) cost factors, in Requests for Proposals (RFP's). Detail specifications will be avoided. RFP's will require offerors to state their method for reaching DTC goals in their proposals.

f. Materiel developers will use contractual clauses that permit flexibility by the contractor. Such clauses should state:

(1) Acceptable range of performance/design parameters.

(2) Specific characteristics or performance criteria that can be altered or eliminated.

(3) Combinations of performance and/or materiel characteristics that are not acceptable.

The materiel developer will state the priority of characteristics and standards to be used in system evaluation to aid the contractor design/trade-off effort. Contractual wording and the contractor's trade-off responsibility must be clear. This will insure an acceptable product for

the Government. The materiel developer will also request the contractor to recommend waivers for technical and operational contract requirements that add to materiel cost out of proportion to their potential value.

g. Development contracts with DTC targets will normally include proper incentives (award fee) for achieving DTC goals or ceiling prices. In a competitive development effort, the presence of competition will normally be deemed sufficient incentive for achieving DTC objectives. The contract will state:

- (1) How tracking the DTC target will be done.
- (2) How achievement of the target is to be determined.
- (3) How progress reports are to be provided to the Government.

The materiel developer will establish a method for evaluating and validating contract progress.

h. The project manager is authorized to trade-off characteristics (within the bands specified in the approved requirements document, DCP, or other authorization document) and schedules to reach the cost goal and remain within thresholds. Effective use of the DTC concept requires close and prompt coordination between the materiel developer, program/project/product managers, contractors, combat developer, and the logisticians, in determining performance trade-offs. A potential performance trade-off may seem cost effective yet be outside the given performance band. If so, submit a request for change to the requirements document through the same channels used in obtaining approval of the basic document.

i. Authority for waiving DTC for Army materiel will rest with the decision authority who would approve the DTC goal or with the authority as designated by the MACOM.

C. DESIGN TO UNIT PRODUCTION COST (DTUPC).

The DTUPC is a contractual goal for that portion of the program goal over which the contractor has control. The DTUPC should only address the system elements which are supplied by the contractor.² The DTUPC does not include any in-house investment costs, Government Furnished Equipment (GFE) costs, contractor nonrecurring costs, or engineering change allowances.³

D. AWARD FEE.

1. General.

The following is based on Defense Acquisition Regulation (DAR) 3-405.5. Award fee provides a means of applying incentives in contracts which are not susceptible to finite measurements of performance necessary for structuring incentive contracts. The award fee amount must be sufficient to provide motivation for excellence in contract performance in areas such as quality, timeliness, ingenuity, and cost effectiveness. Essentially award fee is earned based on the subjective evaluation by the Government of the contractors actual performance. The number of criteria used and the requirements which are represented in the contract will differ widely from one contract to another. Criteria and rating plans should be flexible and motivate the contractor in a positive way to improve performance. The contract should provide for evaluation at stated intervals during contract performance, so that the contractor will periodically be made aware of the quality of performance and will know in which areas improvement is expected. This will make effective the incentive which the award fee can create by

²
US Army Materiel Development and Readiness Command Pamphlet P700-6, "Joint Design to Cost Guide," para. 1.5.4, page 7, 15 October 1977.

³
US Army Regulation No. 70-64, para. 1-6k(4), page 1-2.

inducing the contractor to improve poor performance or to continue good performance. The final award fee decision is unilateral and not subject to the "Disputes" clause of the contract.

2. Award Fee and DTUPC.

Award fee is an equitable technique for motivating a contractor to achieve the DTUPC. The judgmental aspects of award fee evaluations allow the Government to balance DTUPC projections at contract initiation to actual achievements while giving due weight to cost, technical, and other uncertainties encountered and addressed during development. This also permits due consideration of changes in production quantities and rates plus other baseline assumption changes.

CHAPTER III
DATA COLLECTION AND ANALYSIS

A. 1979 SURVEY.

This research was initially proposed by a DARCOM MSC Contracting Officer in 1978. Because the DARCOM policy for application of award fee to DTUPC was only issued in 1976,⁴ the Army Procurement Research Office (APRO) had reservations as to the existence of an adequate data base of contracts with DTUPC and award fee final determinations. The May 1979 survey confirmed that the data base was insufficient to support a study. Therefore, further research was suspended.

B. 1982 SURVEY.

The research was initiated again in 1982 by a new APRO survey that requested data and documentation for each contract with DTUPC provisions regardless of the presence or absence of award fee provisions applicable to the DTUPC ceiling. Information was requested on all active, inactive and completed contracts. A summary of the contracts reported with DTUPC provisions, the application of award fee to DTUPC achievements and the status of final DTUPC and award fee determinations are provided in Figure 1.

C. STATISTICAL ANALYSIS.

One of the objectives of this study is to determine the extent to which award fee influences achievement or betterment of the DTUPC goal. If it can be shown that DTUPC achievement is independent of award fee payment, then it can be concluded that award fee does not influence the DTUPC. At the onset

⁴US Army Materiel Development and Readiness Command Circular No. 715-4-76, Section III, 8 April 1976, and Circular No. 715-11-76, Section III, 17 November 1976.

SUMMARY OF CONTRACTS WITH DTUPC AND AWARD FEE APPLICATION

DARCOM MSC	TOTAL	DTUPC WITH AWARD FEE		DTUPC - NO AWARD FEE	
		FINAL DETERMINATION	OPEN	FINAL DETERMINATION	OPEN
A	12	8(1a)	2(1b)		
B	7	4	3		
C	8	2	3	(1)	2
D	4	1(1a)		1	1
E	2	1			1 c
F	5	4	1		
G	8	1	2	4 d	1
TOTAL	46	21(2)	12	5(1)	5

LEGEND: () - INITIALLY APPLIED, SUBSEQUENTLY DELETED

a - BOTH DTUPC AND AWARD FEE DELETED

b - AWARD FEE DELETED

c - REPORTING ONLY

d - DTUPC NOT SUCCESSFULLY TRACKED ON 2 CONTRACTS

FIGURE 1.

of the research it was envisioned that the data would permit the use of the statistical chi-square test of independence of principles of classification. The test is used to make a decision as to whether a set of classification criteria is meaningful or effective. The test receives its name because the hypothesis tested is that the principles of classification are independent. The data is classified according to Figure 2. The statistical test compares actual frequency of numbers observed in each cell to the expected or calculated frequency. As a general rule, it is desirable that the expected frequency in any cell be not less than five. This would require that there be at least eleven observations for the total in the row of no award fee in Figure 2. With only one observation in the cell, "No Award Fee/DTUPC Attained," not enough data exists to make a valid chi-square classification test. However, a test using the probability of the hypergeometric distribution for fixed row totals and fixed column totals can be used. When the number of rows and columns each equal two (as seen in Figure 2), the test is known as "Fisher's exact test."⁵

The statistical hypothesis tested is

$$H_0: P_1 = P_2$$

$$H_a: P_1 \neq P_2$$

where

P_1 = Proportion of DTUPC attained when an award fee is in the contract and

P_2 = Proportion of DTUPC attained when no award fee is in the contract.

$$\begin{aligned} \text{Probability} &= \frac{\binom{16}{10} \binom{8}{1}}{\binom{24}{11}} + \frac{\binom{16}{11} \binom{8}{0}}{\binom{24}{11}} + \frac{\binom{16}{4} \binom{8}{7}}{\binom{24}{11}} + \frac{\binom{16}{3} \binom{8}{8}}{\binom{24}{11}} \\ &= .0257 + .0017 + .0058 + .0002 \\ &= .0334 \end{aligned}$$

⁵W. J. Conover, Practical Nonparametric Statistics, John Wiley, 2nd Edition, New York, New York, 1980.

	DTUPC ATTAINED	DTUPC NOT ATTAINED	TOTAL
AWARD FEE	10	6	16
NO AWARD FEE	1	7	8
TOTAL	11	13	24

DTUPC ATTAINMENT WITH AND WITHOUT AWARD FEE

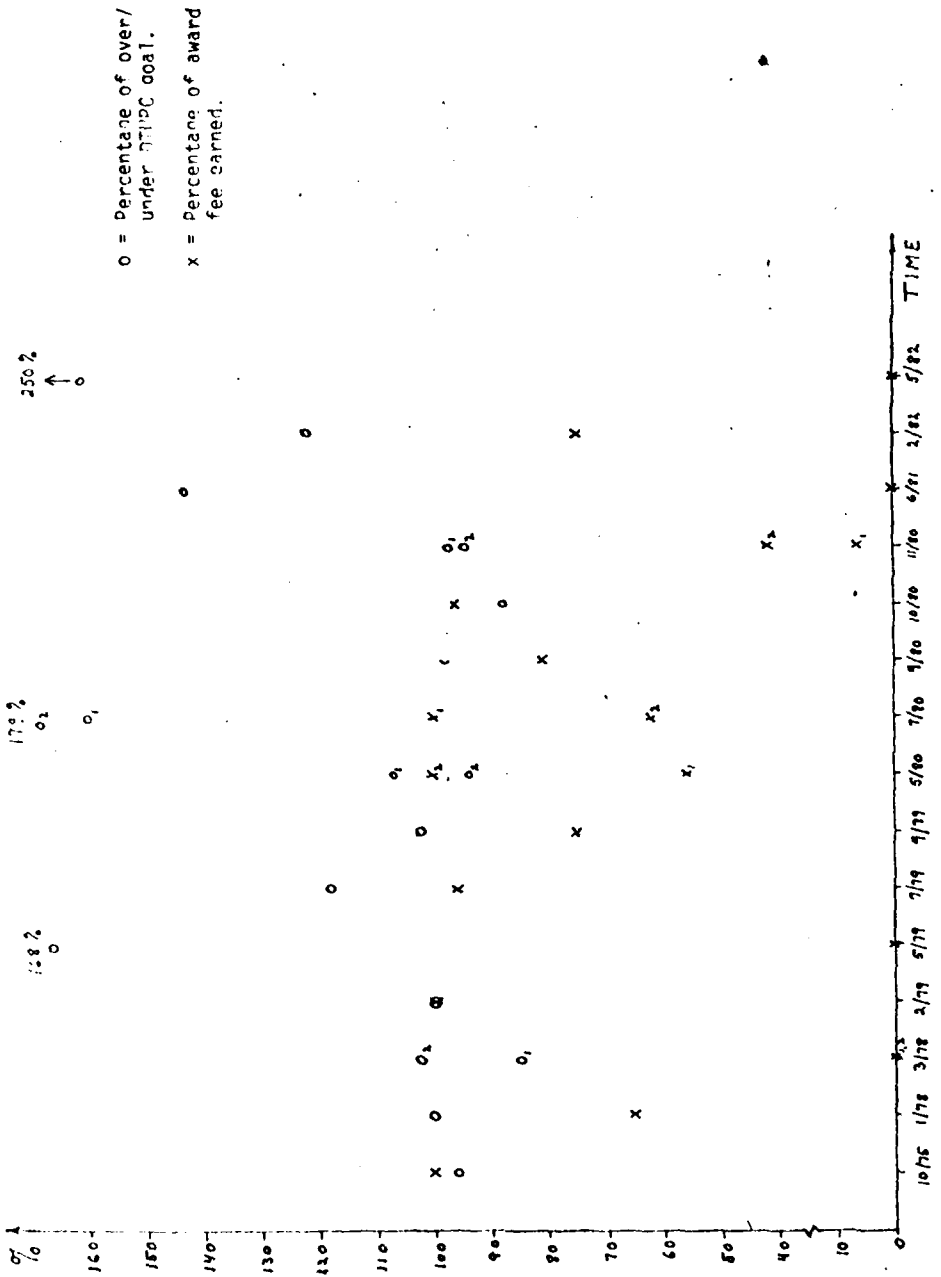
FIGURE 2.

If the critical level for the test is picked to be .05 then the hypothesis H_0 is rejected since there is less than 4 chances out of 100 that $P_1 = P_2$. The significance of this statistical test indicates award fee influences DTUPC.

To see how the achievement of the DTUPC influenced the award fee, further analysis was done on the percentage of award fee earned and the percentage of over/under attainment of the DTUPC. There were 19 contracts from which this data could be extracted.

Figure 3 lists the contracts examined in chronological order illustrating the percentage of award fee earned by an X and percentage of over/under attainment of the DTUPC by O's. Each X and O designates one contract. Note that there are cases in which the contractor did not achieve the DTUPC but still received a large percentage of the available award fee which was due to multiple evaluation criteria such as trade-off analysis, management of the DTUPC effort, and trackability and confidence in the DTUPC cost data. In addition, the contractor may have been judged to have been very successful although not meeting the DTUPC when initial assumptions are compared to actual developments at final determination. Further note that some contractors who achieved or bettered the DTUPC goal received low percentages of available award fee which was due to a lack of trackability or confidence in the final DTUPC data generated by the contractor

There are also multiple evaluation criteria where several DTUPC's are involved but only one award fee. For example, in two cases two of the three DTUPC's were not achieved but a percentage of the award fee was still granted; while in another case, all three DTUPC's were attained allowing the contractor to receive 100 percent of the award fee.

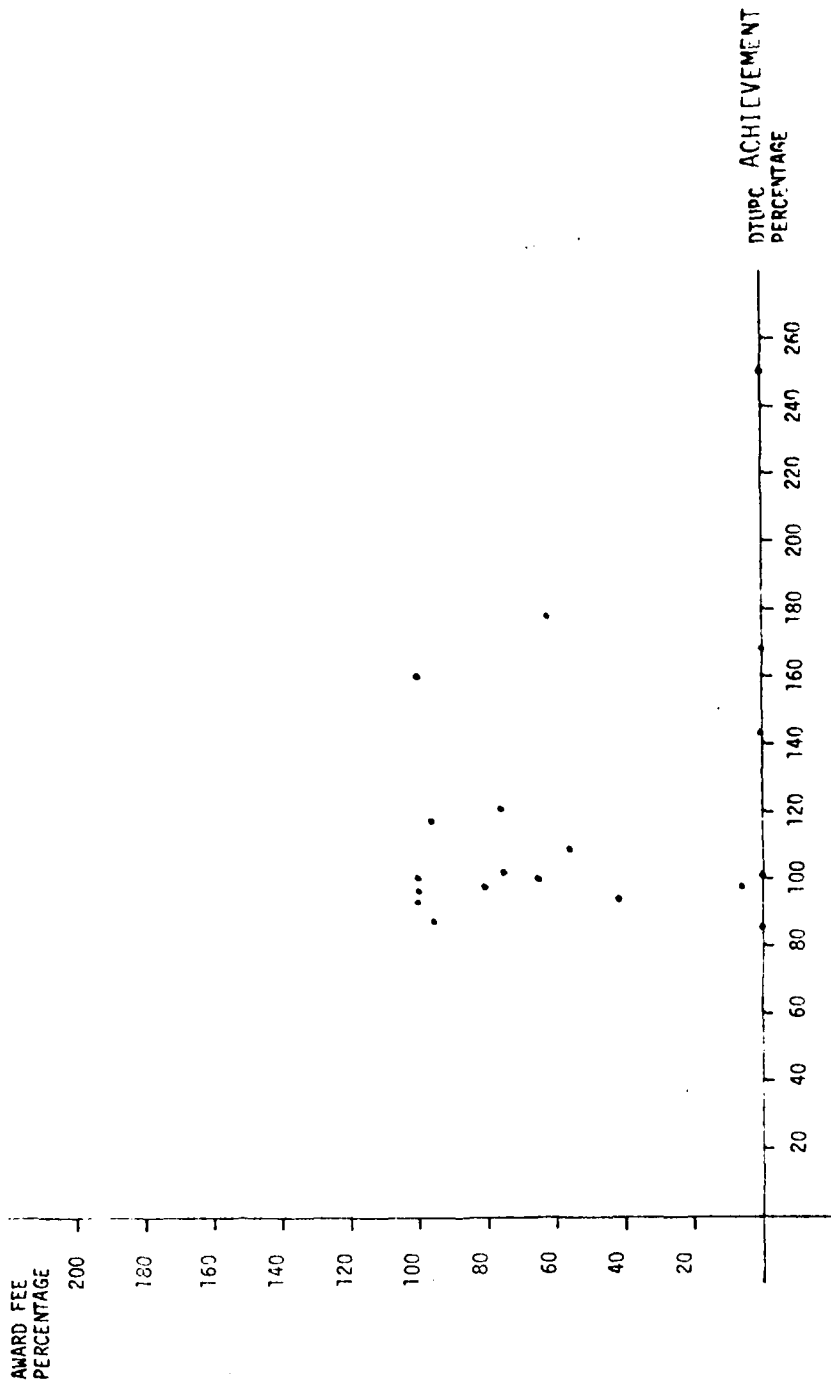


PERCENTAGES OF AWARD FEE EARNED AND DTUPC GOAL ACHIEVED

FIGURE 3.

A correlation analysis was performed on the data in Figure 4 to test the hypothesis that there is a correlation between percentage of award fee received and percentage of attainment or non-attainment of DTUPC. Figure 4 shows the plot of percentage of award fee granted versus percentage of over/under DTUPC. The analysis showed a correlation coefficient of -0.32 , which when tested at a critical level of $.05$ is not significantly different from zero. A negative correlation is consistent with the theory that the greater the percentage of overrun of the DTUPC goal the smaller the percentage of award fee granted. However, no real significance can be drawn between the percentage of award fee earned and percentage of attainment or non-attainment of DTUPC from the magnitude of the correlation coefficient nor from the scatter diagram results in Figure 4.

In summary, the award fee appears to influence the achievement or betterment of the design to cost goal; however, there is no statistical correlation between the percentage of award fee received and the percentage of attainment or non-attainment of the design to cost goal.



SCATTER DIAGRAM OF PERCENTAGES OF DTUPC ACHIEVED AND AWARD FEE EARNED

FIGURE 4.

CHAPTER IV

NON-APPLICATION OR DELETION OF DTUPC AND AWARD FEE PROVISIONS

A. INTRODUCTION.

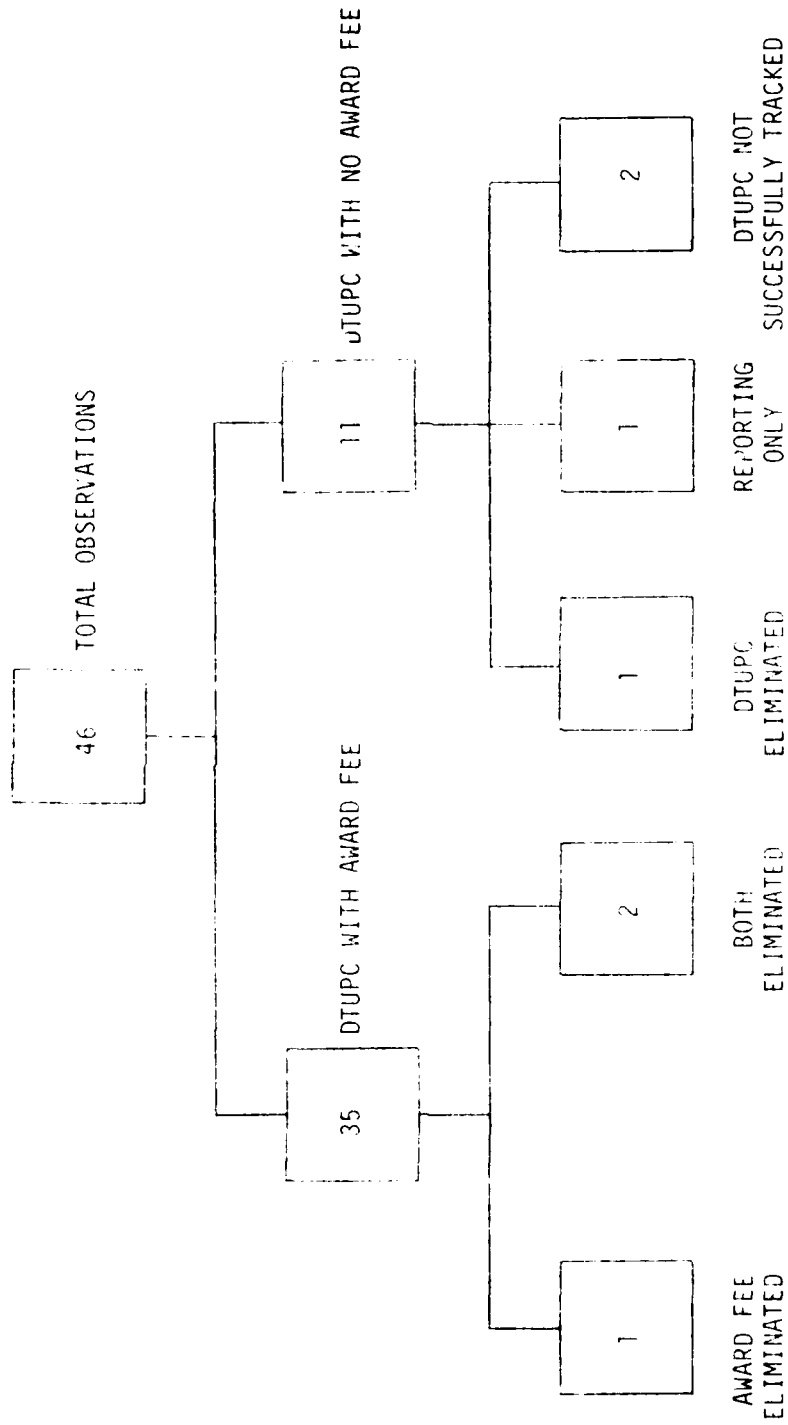
The requirement for DTC applications was introduced in 1971.⁶ In 1976 an additional policy was issued to require the inclusion of an award fee applied to achievement or betterment of DTUPC on those programs where only one contractor is selected to proceed in development, provided the award fee could be expected to generate significant rewards and/or penalties.⁷ As pointed out in Figure 1, there were a number of contracts in which the DTUPC, award fee or both were eliminated after contract award. Figure 5 summarizes the observations. It should be noted that 17 of the contracts are open and subject to deletion of DTUPC, award fee or both contract provisions. A review of the initial survey results led a senior acquisition official to question why award fee was not applied to each instance of a DTUPC provision. This chapter will address that question to the extent possible.

B. DTUPC ELIGIBLE, DTUPC NOT APPLIED.

The research did not attempt to identify all DTUPC eligible acquisitions to which DTC principles were not applied because this was not an objective of the study. The DTC regulation states that the "authority for waiving DTC for Army Materiel rests with the decision authority who would approve

⁶
US Army Materiel Command, "AMC Guide for Design to Unit Production Cost (DTUPC)," p. 1, 17 December 1974.

⁷
US Army Materiel Development and Readiness Command, Circular No. 715-4-76, Section III, para. c., p. 4, 8 April 1976.



THE USAGE OF DTUPC AND AWARD FEE PROVISIONS

FIGURE 5.

the DTC goal or with the authority as designed by the MACOM."⁸ The decision authority thus could be the Defense System Acquisition Review Council (DSARC), Army System Acquisition Review Council (ASARC), a Headquarters Department of Army (HQDA), In-Process Review (IPR), HQ DARCOM or a subordinate MSC Commander of Project Manager.

C. AWARD FEE NOT APPLIED TO DTUPC.

I. General Reasons for Not Applying Award Fee.

There were 11 contracts observed in this category. As pointed out in paragraph A of this chapter, award fee is to be applied for programs in which only one contractor is selected to proceed in development when such can be expected to generate significant rewards or penalties. Based on APRO's analysis, two aspects of this policy appear to work against application of award fee. First, the words "expected" and "significant" are not defined. No percentage of probability nor percentage or dollar value of program costs are given. Thus the decision is highly judgemental. Secondly, there is no requirement for written documentation of the decision.

AR 70-64 is similarly worded in that it states in part:

"Development contracts with DTC targets will normally include proper incentives (award fee) for achieving DTC goals or ceiling prices. In a competitive development effort, the presence of competition will normally be deemed sufficient incentive for achieving DTC objectives."⁹

The word "normally" is permissive. Additionally the second sentence says that competition for follow-on work is the incentive when two contractors

⁸ US Army Regulation No. 70-64, "Design to Cost," para. 1-5.a., p. 1-3, 1 January 1980.

⁹ US Army Regulation 70-64, "Design to Cost," para. 1-6.4, p. 1-3, 1 January 1980.

are under contract for development of the system. But even that policy statement contains the word "normally." In those instances where competitive development existed and award fee was applied to the DTUPC, the overwhelming conclusion of field personnel was that there was a waste of award fee dollars and administrative expenses. Competition for the follow-on effort was indeed the driver to meet or beat the DTUPC, not award fee.

2. Specific Reasons Given for Not Applying Award Fee.

The following discussion is based on documentation and interviews concerning 7 of 11 observations in this category.

Government personnel, with the contractor's input and agreement, decided that there were too many uncertainties to incentivize DTUPC. Due to the rapidly changing technical state-of-the-art, it was impossible to estimate with any degree of certainty the actual production costs. As a result of continual technical changes required to meet the threat, it would have been impractical to negotiate a realistic DTUPC until the end of the development contract. Thus an incentive of DTUPC was meaningless.

Another acquisition did not have award fee provisions on the DTUPC in the advanced development (AD) contract because much design and experimental work was planned. At the start of AD contract the Government had only established that existing technology could "do the job," but the Government did not know what the item would look like. It was felt incentivizing the DTUPC during AD was premature. Engineering development (ED) appears more appropriate for an award fee on DTUPC because an early form of specifications is available.

Award fee was not applied to DTUPC in one instance because, based on the Government Cost Estimate and available funding at the time of solicitation, there would not have been an adequate amount of award fee on DTUPC.

The total dollar value of one development contract was too low for motivating the contractor with award fee. Any award fee that bore a reasonable relationship to the overall contract amount (e.g., 3-6%) would have been too small to serve as an effective incentive.

One solicitation contained a provision for award fee applied to DTUPC as well as other factors (timely progress, meeting milestones, identification and resolution of problems, etc.). However, the offeror who ultimately was awarded the contract requested that no award fee be included in the contract because of the budget for the program. As it was fairly tight, the contractor preferred to put the dollars initially set aside for award fee into the fixed price incentive ceiling of the contract. The Government accepted the contractor's request. Reliance was placed on management by the contractor and Government monitorship of the contractor's effort. Also, the contractor knew what the market would bear (i.e., what the contractor would have to propose to insure program continuation). Thus, the production contract served as a "carrot."

Another example of non-application of award fee concerned a system that had a relatively low unit cost and low production quantity. Consequently, the greatest concern was not cost, but technical performance, specifically software. An analysis of two other program award fee pools indicated they approximated 0.6% of negotiated recurring costs. When this factor was applied to this program's estimated recurring costs, the resultant amount was considered too low to effectively motivate the contractor. The decision was made to place the award fee dollars where the biggest problem and highest potential pay-off existed--software.

The last observation involved a program that capitalized on existing commercial components and design. It was a short leadtime program in which

space was a limitation. The Government did not want to divert the contractor from consideration of the maximum use of commercial item. Thus no award fee was applied to DTUPC.

D. DTUPC AND AWARD FEE INITIALLY APPLIED, AWARD FEE SUBSEQUENTLY DELETED.

One contract in this category began with award fee on DTUPC, but experienced significant cost growth. As a result the requirement was reduced from five to three systems. In the restructure of the contract the award fee was deleted.

In another instance the award fee applied to DTUPC was deleted because of funding and cost growth problems. Cost growth occurred and additional funds were not available. The award fee was deleted and the dollars were used for engineering development.

E. DTUPC AND AWARD FEE INITIALLY APPLIED, BOTH SUBSEQUENTLY DELETED.

Rationale was available for only one instance in which both DTUPC and award fee were deleted from a contract. The original DTUPC was \$3564 versus a contractor estimate of \$20,000 to \$30,000. The contractor during performance was far from the DTUPC and expected to receive no award fee. The contractor agreed to waive the right to award fee for DTUPC if the Government agreed to delete the DTUPC requirement. The contractor felt \$250,000 would be saved by the avoidance of DTUPC data accumulation and submission.

F. SUMMARY.

The reasons given for applying award fee to DTUPC or dropping award fee, DTUPC or both provisions appear reasonable. The rationales discussed in the preceding sections of this chapter appear to be judicious decisions based on circumstances of the individual acquisitions and events that occur during contract performance. In the case where provisions were deleted the parties

prudently agreed to forego contract provisions that were no longer motivators, achievable, and in the best interests of overall program objectives.

CHAPTER V

FACTORS THAT AFFECT DTUPC - AWARD FEE SUCCESS

A. INTRODUCTION.

In order to analyze fully the effectiveness of award fee provisions on DTUPC accomplishment, the research included interviews and written responses based on an APRO-developed questionnaire. An analysis of the responses can be grouped into two categories. One category is a set of factors that the research concluded affect the success of award fee in influencing achievement of DTUPC and award fee. These factors will be discussed in this chapter. The second category of responses to be discussed in the chapter are relevant issues to be considered by decisionmakers in consideration of future DTUPC and award fee policies.

B. FACTORS AFFECTING DTUPC.

The DTUPC has been expressed as a goal, target, or ceiling. Generally, it is referred to as the DTUPC, a monetary figure set forth in the contract that the contractor strives to meet or beat. There are several subfactors that are critical to DTUPC.

1. Realism. The Government policy on the DTUPC requires that goals be clear, complete, measurable, valid and achievable.¹⁰ The policy is unequivocal, but there can be a wide variation between policy and implementation.

Both contract parties can cause, individually or jointly, a breakdown in policy implementation. An example relates a situation in which the Government estimate of the DTUPC was \$333,000, the contract DTUPC was \$235,000 and the actual verified DTUPC was \$305,000. In another case the

¹⁰Ibid., para. 1-6 f and g. Page 1-1.

contractor proposed a DTUPC that was too low. The Government specifically told the contractor that his goal was too low and he replied, "We'll meet it!" The Government accepted the proposed DTUPC, the contractor did not come close to the DTUPC, and the contract was terminated.

Two points seem obvious. First, the contractors "bought in" on the DTUPC. Also, the Government did not apply cost realism to the contractor's proposed DTUPC. A principle of Government contracting is that the final agreement should be fair and reasonable to both parties. The above cases violated that principle with poor results.

2. Exactness. AR 70-64 requires identification of DTUPC including specification of cost elements, cost categories and elements of the Work Breakdown Structure (WBS).¹¹ Also to be included in appropriate acquisition documents are supporting assumptions such as quantities, production rates (generally, the first production contract), time frame, learning curve, and deflation indices.¹² The DTUPC will normally be the recurring costs directly under the control of the contractor and does not include any in-house investment costs, Government-Furnished Equipment (GFE) costs, contractor nonrecurring costs, or engineering change allowances. Generally, the DTUPC provisions reviewed contained the above data.

3. GFE Interface. Interfaces between GFE and the system under development can create problems. If the detailed performance and design specifications of GFE are not specifically cited in the development contract, a contractor can and has assumed interface and performance characteristics

¹¹ Ibid., para. 1-6 g., page 1-1 and 1-2.

¹² Ibid., para. 1-6 k(1), page 1-2.

of the GFE to decrease R&D and DTUPC costs at increased total system costs. An example is a provision for connectors between the GFE and contractor-developed end items. It must be clear whether the GFE comes with connectors or if the end item will provide the connectors. Another example is a starter or alternator for a vehicle which may be furnished with the GFE engine or provided by the contractor as part of the end item.

4. State-of-the-Art. Technology that is new or that experiences rapid advancement creates problems in development of realistic DTUPC's. One acquisition entailed technology not previously pursued in this country. Another example was a technology that promised positive development, but with no firm Government or industry idea as to the configuration or composition of the end item. All that was known is that the technology could result in an end item that meets the requirement.

5. Production Quantities. Care must be exercised in the establishment of the baseline production quantities for final DTUPC and award fee determinations. Production quantities have been cited in several ways. One method is a single quantity for full scale production (FSP) without a low rate initial production (LRIP) figure. Another is to cite both LRIP and FSP figures. A third method noted is to provide two or more production quantities; e.g., 15 and 100 each; 350 and 1000 each; and 1000, 5000 and 10,000 units.

The most practical method of citing production quantities is to cite at least two production figures for both LRIP and FSP. This method recognizes the reality of the Planning, Programming, and Budgeting System (PPBS) affordability problems and Congressional dictates that cause variations between baseline DTUPC production quantities and actual authorizations.

6. Learning Curves and Production Rates. A recent General Accounting Office (GAO) report on a major Army program noted that nonachievement of baseline learning curves and scheduled production rates can have a significant impact on actual unit production costs. The GAO stated that a one percentage point variation in the learning curve could change hardware costs by about ten percent. A monthly production quantity variation of ten units could change hardware costs by 0.6 percent.¹³

Care must be taken in the establishment of the baseline learning curves and production rate. If not, the contractor can either be unfairly rewarded or lose award fee to which he would normally be entitled.

7. Adjustment Factors.

a. General. DTUPC's are set upon entry into Full-Scale Engineering Development (FSED) and approved at Milestone II. The period of time between a Milestone II decision and award of a Low Rate Initial Production contract may be at least 2 or 3 years. If the DTUPC achievement is also tied to full scale production, the time period between the DTUPC approval and final DTUPC achievement determination is even greater. Thus, it is essential to provide adjustment factors to permit the actual DTUPC to be compared to the DTUPC expressed in the development contract in base year dollars. There are a variety of adjustment factors that must be provided to permit a realistic and reasonable comparison of actual DTUPC figures to base year figures.

b. Deescalation of dollars. The major adjustment factor is one for deescalation of the final DTUPC figure for comparison with the baseline DTUPC cited in the basic contract. The adjustment factor generally has two parts.

¹³US Army Cost Discipline Advisory Committee, "A Report to the Secretary of the Army," page 52, 16 December 1981.

One part is for labor based on the Bureau of Labor Statistics (BLS) "Monthly Labor Review" and the other part for materials based on the BLS "Wholesale Prices and Price Indices." The contract provisions reviewed contained labor and materiel deescalation factors based on BLS indices.

c. Other critical adjustment factors. Adjustments for situations such as major technical changes, changes in contractors' accounting systems, and contractor reorganizations are seldom or never addressed in contract provisions but can have a great impact on DTUPC achievements.

C. DATA REQUIREMENTS.

Data is essential to track DTUPC achievements and to make determinations. Data can also be costly.

DARCOM MSC and Department of Defense (DOD) Data Item Descriptions (DID's) are in the process of revision. One change is to require the contractor to develop total system budgetary estimates. This will permit tracking of Life Cycle Costs (LCC's), not just DTUPC.

Several points should be kept in mind in tailoring DID's for DTUPC. Provisions must be made to track major changes in the technical requirement and their impact on DTUPC. One technique that has met with success is to require the contractor to explain any DTUPC variance over ten percent from one reporting period to another. Another successful technique was to minimize data requirements by working closely with the contractor and utilizing the contractor's reporting system to the maximum extent possible.

D. EVALUATION CRITERIA AND WEIGHTING.

The field has exhibited much thought and care in the structure of DTUPC award fee criteria. An example of a good set of criteria is shown in Figure 6.

AWARD FEE EVALUATION CRITERIA AND ASSIGNED WEIGHTS*

Evaluation Period or Event	Percent of Award Fee Pool Available	1. Management and Operation of Design-to-Cost Activities. (Includes: the ability of the contractor to provide continuous, timely and in-depth visibility into his design processes; demonstration that top management is actively involved and exerting influence throughout the organization as it pertains to design-to-cost; management of logistics support requirements including reliability and maintainability aspects; timely management visibility into problem areas and related trade-off analyses.)	2. Ability to Meet the Design-to-Cost Objective. (Projected or actual performance)
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(Evaluated under criteria and weights set forth in Appendix E or the Original Evaluation Plan)

1. First Evaluation Period	10%		
2. Second Evaluation Period	15%	85%	15%
3. Third Evaluation Period	10%	85%	15%
4. Award of First Production Contract	30%	5%	95%
5. Award of Second Production Contract	35%	5%	95%

*May be changed by Award Fee Evaluation Board if deemed appropriate.

FIGURE 6. AWARD FEE EVALUATION CRITERIA

Several points should be noted. First, the early evaluation periods place emphasis on the management and operation of Design to Cost (DTC) activities. This emphasis is to motivate the contractor to organize and implement a viable DTC program.

The last two award fee periods are based on award of production contracts. This emphasizes that payments will be based on achievement instead of effort. It stresses known contract prices rather than projections.

E. DETERMINATIONS.

Determinations of award fee earned by the contractor for DTUPC achievements are of two types. The two types are interim and final determinations. It is essential to conduct on-site verification of DTC effort. This permits Defense Contract Audit Agency (DCAA), Administrative Contracting Officer (ACO) and other on-site functional input.

1. Interim Determinations.

Interim determinations have two useful purposes. They act both as a motivator and as a control or review function.

The initial review or two places emphasis on the contractor's DTC program. The review judges the contractor's effort to implement a sound DTC program. Points to be addressed include management involvement, trade-off analysis procedures, manufacturing representation, and the contractor's tracking and reporting system. Interim determinations are a vehicle for communications between the parties.

2. Final Determinations.

Early applications of award fee to DTUPC had several faults. First, the award fee determinations were based on projections, not actual production contract prices. Secondly, if the final determination was to be based on production contract prices and if the production contract did not materialize, the contractor did not receive any award fee. This situation can have a

negative impact on a contractor that diligently pursued achievement or betterment of the DTUPC. A last fault was the use of a go, no go decision on award fee for DTUPC achievement. Award fee is a subjective after-the-fact evaluation of actual performance. In this situation a contractor may have come close to achieving the DTUPC (101% - 110%) but he received no award fee credit for almost achieving a DTUPC that may have been overly optimistic. Additionally, the contractor receives no credit for solving technical, cost and other uncertainties.

F. MANAGEMENT EMPHASIS.

Management emphasis is a key to any successful endeavor. Since there is obviously Government and industry management involvement in Government contracts, both influence the degree of success of DTUPC and associated award fees.

The Department of Defense (DOD) requirements for DTC were promulgated in 1971 and the DARCOM requirement for award fee applications was issued in 1976. DTC was not heavily emphasized in the late 1970's. Award fee policy was tempered by the requirement to apply only when it can be expected to generate significant rewards or penalties, and the absence of a need for documentation of the non-application decision. This changed with publication of the Carlucci Recommendations, specifically Number 22.¹⁴ Recommendation Number 22 calls for appropriate incentives to industry by associating fee awards with actual costs achieved during the early production runs.

¹⁴Deputy Secretary of Defense, Memorandum, Subject: "Improving the Acquisition Process," page 24, April 30, 1981.

One of the steps taken to implement Recommendation Number 22 was the issuance of Interim Guidance for Design to Cost Contract Incentives. It outlines procedures for rewarding contractors who demonstrate that they have achieved DTC requirements and for penalizing those who do not.¹⁵

Several points in the interim guidance are worth noting. First, penalties for not demonstrating that actual costs are at or below the stated goal are not defined. The field can construe the statement to mean no award fees. Award fees are positive, not negative incentives. Unofficially the statement is interpreted to mean including program or contract termination, no follow-on contract, and no award fee. Incentives should not be applied to competitive developments because they generally do not provide contractor motivation commensurate with the cost of administration. The last point is to pay DTC incentives only if reliability and maintainability requirements have been met. Generally, the field has been implementing this guidance for at least the last few years. A major purpose of this discussion is to demonstrate the current DOD interest in DTC and appropriate incentives.

There can still be problems with policy implementation even with high level management emphasis. Distinct comparisons can be made between successful and unsuccessful DTUPC and award fee applications. The attitude of the Government Project Manager (PM), his industry counterpart and that of the contractor's management have a direct influence on the degree of successful DTUPC achievement and award fees earned. As stated early in

¹⁵Under Secretary of Defense, Research & Engineering, Memorandum, Subject: "Interim Guidance for Design to Cost (DTC) Contract Incentives," 3 Dec 81.

the report, some contractors bought-in on the DTUPC. This practice is a conscious management decision and shows a lack of serious desire to meet or beat the DTUPC.

Research in the area of award fee contracts in general shows that it works, not because of its technical properties but because of the managerial environment it fosters in the Government PM office.¹⁶ The research has shown that successful DTUPC award fee applications include a PM who took the provisions seriously, expressed those feelings to the contractor at the outset of contract performance and reinforced those concerns to the contractor throughout the contract term. Unsuccessful applications exhibited a lack of Government interest. In the latter cases the DTUPC award fee application provisions were just some more clauses that had to be put into the contract, but were not emphasized and were subsequently forgotten by the Government.

Even if the Government's positive desires are expressed to the contractor the results may be negative. Dr. Hunt in a recent report on contractor perceptives showed that the influence of award fee on program outcomes is mixed. In Dr. Hunt's study the contractors responded: "no influence," "influence," and "don't know." The consensus seemed to be the award fee "certainly does force responsiveness, if that is what the customer wants."¹⁷ Successful applications of award fee to DTUPC are marked by contractor management interest and emphasis.

¹⁶Raymond G. Hunt, "Concepts of Federal Procurement: The Award Fee Approach," Defense Management Journal, (Second Quarter 1982), page 10.

¹⁷Raymond G. Hunt, "Use of Award Fee in Air Force System and Subsystem Acquisition," pages 181-183, March 1980.

G. CONTRACT PERFORMANCE AND ADMINISTRATION.

Once the contract is signed, the parties strive toward successful achievement of the contract terms and conditions. Both parties contribute to the results of performance in an active or passive manner. It has been observed that an acquisition can have an exemplary DTUPC award fee provision, but result in contract and program termination because of poor contract performance and administration.

1. Contractor. The contractor management, program director and program personnel must be serious about the DTUPC and potential award fee earnings. If not, the results will be no positive DTUPC achievements or award fees earned. The award fee evaluation criteria cited in Figure 4 shows the importance of early and concerted effort directed toward DTC activities. Once DTC activities are formalized and operating in a dynamic manner management needs only to monitor DTC activities.

One important point made by field personnel is the need for the contractor's DTUPC team to have manufacturing as well as design representation. This was considered very important because DTUPC has both development and production implications.

2. Government. The PM who stresses DTUPC achievement to the contractor is off to the right start. The PM must also impress his staff and the Government contract administrators of the importance of DTUPC.

PM's are accused of losing sight of DTUPC in myriad of program goals, priorities, and problems. They are also criticized for being too development-oriented. Government contract administrators are considered "paper-pushers" and not active monitors of contract performance. While some of the criticism may be justified, the majority of PM's and administrators are dedicated and conscientious. Nevertheless, they should be aware of these perceptions.

One acquisition exhibited a synchronized Government effort toward administration of contractor DTUPC efforts. The cognizant Defense Contract Administration Service element monitored the contractor's DTUPC effort on-site constantly and reported to the MSC and PMO quarterly. It was cited as an example that DTC works.

H. SIZE OF AWARD FEE POOL AND DISTRIBUTION.

This topic generated many comments. Many people felt the award fee pool must be large enough to offset profit on the estimated cost of follow-on production contracts and value engineering (VE) savings that can accrue to the contractor under production contracts. An extreme case cited was \$167,000 award fee for DTUPC on a \$68 million development contract. Obviously, award fee was not a motivator in that instance.

Some people feel that when fixed or incentive fees are subtracted from the maximum limit of fifteen percent (15%) for cost-type development contracts, an insufficient amount is left for award fee application to DTUPC achievement.¹⁸ Contractors have criticized the Government for failure to stress the importance of DTUPC achievements by providing small award fee pools. The above are valid criticisms in light of the DTC objective: "To establish cost as a factor equal in importance with technical requirements, and schedule throughout design, development, production, operation,

¹⁸US Department of Defense, "Defense Acquisition Regulation," para. 3-405.4(c), 3-405.5(d) and 3-405.6(c), 1976 edition as amended.

and support of weapons systems, subsystems, and components."¹⁹ Available fee pools must be allocated to emphasize Government concerns and priorities and to avoid criticism.

I. SUMMARY.

This chapter has discussed the salient factors that should be addressed in the application of DTUPC and associated award fees. If realistic and effective definition, allocation or performance of any of the factors is not present in an acquisition, the award fee used in conjunction with DTUPC and award fee may fail to meet the objectives of DTC.

¹⁹US Army Regulation 70-64, "Design to Cost," para. 1-5.a, page 1-1, 1 January 1980.

CHAPTER VI
FUTURE POLICY CONSIDERATIONS

A. INTRODUCTION.

The research identified areas of interest to field personnel that, although not critical to the success of DTUPC award fee applications, warrant discussion. The discussion will serve to highlight field concerns and provide input to considerations of future policy on DTUPC/award fee guidance.

B. DTUPC AS A SOURCE SELECTION CRITERION AND MAJOR NEGOTIATION TOPIC.

Acquisitions subject to DTUPC and award fee application result in solicitations that are lengthy, involved, and contain interrelated terms and conditions. This complicates proposal preparation, evaluation, and negotiation. Field personnel are of the opinion that the end result is insufficient emphasis placed on DTUPC. The same personnel offered reasonable solutions to the problem.

DTUPC must be made a meaningful, visible, and appropriately weighted source selection criterion to include past DTUPC achievements. This approach would place the proper emphasis on DTUPC in relationship to the other Government criteria, objectives, and priorities.

The Source Selection Evaluation Board (SSEB) can establish a separate evaluation subgroup for DTUPC. This lends credibility to the DTUPC emphasis in the evaluation criteria. It also permits knowledgeable specialists in DTUPC to provide evaluation input. In one case there was leveling of DTUPC proposals because the evaluation teams did not understand DTUPC. A specialized evaluation subgroup for DTUPC would prevent recurrence of this situation.

DTUPC should also be a major negotiation topic for some of the reasons

which have been cited earlier. It stresses the Government emphasis on DTUPC. It will also provide a complete and clear meeting of minds of the DTUPC and its attendant tracking and evaluation plans and procedures.

C. AWARD FEE ROLL-UP.

Award fee roll-up means that award fee available but unearned at one evaluation point remains available at a subsequent evaluation point. The DARCOM policy strongly discourages but does not prohibit award fee roll-up. It must be assumed that the DARCOM policy recognizes that there may be or are exceptions to the general rule on award fee roll-up.

Those in favor of award fee roll-up for DTUPC say it maximizes motivation of the contractor. It permits the maximum available award fee "carrot" to be held in front of the contractor under the final award fee determination. Even though DTUPC actions early in development have the highest impact of ultimate production costs, late development cycle DTUPC actions can still improve DTUPC results. Roll-up motivates the contractor to keep pace with end item development and manufacturing technologies throughout development for application to DTUPC reductions.

People against award fee roll-up feel there is not room for exception to the general rule against roll-up. It has been alleged that DOD experience has shown that some contractors have a tendency to postpone certain actions required by DTUPC, if they know that at a later date they can obtain award fee previously lost.

The consensus is that roll-up is appropriate if rolled-up to an evaluation tied to actual production contract cost and pricing data. The ultimate objective is lowest realistic production costs and award fee roll-up to an evaluation based on production cost and pricing data enhances achievement

of that objective.

D. COMPETITION VERSUS SOLE SOURCE.

Competition provides solutions for many acquisition problems. The current policy on award fee application to DTUPC recognizes that competitive development negates the need for award fee on DTUPC. One dual developer acquisition applied award fee to DTUPC on both contracts, since the practice was not prohibited. The Government personnel involved agreed the award fee dollars on DTUPC were wasted as were the administrative costs and time. The competition for the follow-on contracts was the driver to reduce DTUPC.²⁰ Obviously, competition is not always feasible. In cases where sole source procurement of development and production is the practical and feasible acquisition strategy, the award fee should be applied to DTUPC, provided the conditions cited in Chapter V are present.

Situations have occurred in which the contractors knew they were sole source and that there were large production quantities involved. In other cases the contractors felt there was little potential for Army production quantities. An example is an acquisition to update an item that is currently in the inventory with increased capability and reliability. Strictly commercial development is also being pursued by industry. The Government contractors (three developers) feel that the improvement they can make cannot be sufficient to warrant replacement of the current inventory or replace a military adaptation of the item being developed for the commercial marketplace. DTUPC is typically not successful under these conditions.

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US Defense Systems Management College, "Lessons Learned, Multiple Launch Rocket System," Appendix F, para. 2.b.(10), pages F-9, F-10, July 1980.

One technique used with sole source development and contemplated sole source maturation and LRIP may alleviate poor DTUPC achievements. If the sole source developer submits what the Government considers a high production cost proposal, the sole source solicitation may be canceled and a competitive solicitation issued. If proposed production costs are still too high, the requirement is canceled. This can only occur when there is a low risk TDP adequate for competition, sufficient leadtime, and readily available substitutes.

E. GOVERNMENT-DEVELOPED ITEM.

There are acquisitions where the Government does most or all of the development and design of the item. DTUPC discipline is not applied to such effort. No manufacturing and producibility engineering is applied during development. When the requirement is competed for maturation and LRIP, DTUPC discipline is introduced for the first time.

Two questions can be asked about the situation. First, why isn't DTUPC discipline applied to Government in-house development programs? This is a valid question that deserves the attention of policymakers. Secondly, should DTUPC be applied to the industry effort since it is production engineering and not development? The response to these questions could be either: (1) DTUPC need not be applied because AR 70-64 allows waiver of the DTC requirement or (2) application of DTC on production engineering may be a case of better late than never.

F. INCENTIVES OTHER THAN AWARD FEE.

Since 1976, award fee has been the primary means of incentivizing DTUPC. However, there are other incentive techniques that can and have been applied. Current policies and practices have made non-award fee incentives the exception. Now is the time to give the incentive techniques discussed in the following

paragraphs consideration equal to that of award fee in acquisition strategy development.

1. Priced Production Options.

This technique has been used successfully in competitive developments in lieu of award fee applications. As is true in all decision processes, the use of judgement in its application is critical. The technique should not be used as a substitute for confidence in an overall program.²¹

2. Production Profit Incentives.

This technique is incorporated into two known Army contracts. The contracts are not completed, but the technique has been recognized since 1977.²² Sample Clause 1 (Figure 7) is an extract of the incentive profit provision for production quantities that can be placed in a development, maturation or LRIP contracts for follow-on production quantities.

3. Production Savings Royalties.

This technique was the reason for the submission of project as a candidate for research by APRO. The originator felt that something similar to value engineering royalties is necessary to properly incentivize contractors to achieve or better the DTUPC's. The research noted one instance of this technique in use. Sample Clause 2 (Figure 8) is an extract of pertinent provision of an acquisition in the solicitation phase of procurement.

The impetus of Carlucci Recommendation Number 22 led to this technique. It is a good example of field implementation of acquisition policy.

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The Deputy Secretary of Defense, Memorandum, Subject: "Use of Appropriate Contract Type," June 18, 1982.

22

US Army DARCOM Pamphlet P700-6, "Joint Design-to-Cost Guide," para. 7.4.6, pages 51-52, 15 October 1977.

SAMPLE CLAUSE 1

For the purpose of this provision the DTUPC objective is 2000 dollars (April 1982 dollars). This figure shall be compared with the DTUPC as negotiated for the production quantity of 40,000 units. The DTUPC comparisons are based on the following learning curve factors:

Cost of Unit No. 1 = \$7000

Learning Curve Slope = 92%

The incentive arrangement of this provision shall apply to a target production profit of 7% as follows:

a. For each one percent (1%) that the DTUPC negotiated is less than the DTUPC objective cited above the contractor's profit percentage shall be increased by 0.2%. This increase shall continue until the DTUPC reduction equals 10%.

b. For each one percent (1%) that the DTUPC negotiated is more than the DTUPC objective cited above the contractor's profit percentage shall be decreased by 0.2%. This decrease shall continue until the DTUPC increase equals 10%.

c. All interim adjustments shall be linear.

PRODUCTION PROFIT INCENTIVE

FIGURE 7.

SAMPLE CLAUSE 2

Under this contract CLIN 0001 is subject to a design to unit production cost (DTUPC) program as set forth in Subsection C. 1.2.3 of this contract. Attainment of the DTUPC goal is subject to the incentive cost savings program described below.

a. Based upon a production rate of 100 each or more per month for a total production quantity of 1000 each, a DTUPC goal of (See L.4.5.6)* (In constant FY 82 dollars) has been definitively established for Item 0001.

b. Any changes to the specification may result in a negotiated change to the DTUPC goal. If the change to the DTUPC goal cannot be successfully negotiated, the Contracting Officer may determine the DTUPC goal subject to the Disputes Clause.

c. Upon award of the first production contract, the development contractor will share in any savings to the Government as reflected by a per unit award price less than the DTUPC goal. The development contractor shall receive _____* percent of any unit cost savings to the Government multiplied by the quantity ordered on the First Production Contract.

d. The contractor shall only receive an incentive as described above for the first production contract. The Government is not obligated to purchase any minimum quantity during the first production contract. The total production quantity of Item 0001 shall be set entirely by the Government's requirements. In order to compensate for any quantity variation from the production quantity base in para (a) of this provision a learning curve of _____* shall be applied to the DTUPC goal.

e. If any Government obligation should occur as a result of this provision, payment shall be contractually obligated as part of the first production contract.

*To be completed at time of award.

PRODUCTION SAVINGS ROYALTIES

FIGURE 8.

G. INDEPENDENT DTUPC GROUP.

The lack of emphasis, knowledge and adherence to DTUPC policy and procedures can be alleviated by the establishment of a staff element dedicated to DTUPC. The elements should be at a level at least equal to the PMO and functional directorates.

The independent group would permit independent assessment of both Government and contractor DTUPC efforts at all stages of the acquisition cycle. It could provide knowledgeable cadre to assist in DTUPC application, determination, documentation, tracking and evaluation.

One DARCOM MSC has taken steps to establish a DTUPC independent of PMO's, procurement, engineering, development and command elements and customers. This idea merits consideration for DARCOM-wide application.

HQ DARCOM has a newly established Should Cost Group in the Procurement and Production Directorate. Since both DTUPC and Should Cost have the goal of reducing production costs, this group and any MSC established elements could have the mission of supporting both topic areas.

CHAPTER VII
SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION.

Design to Cost (DTC) strives to establish cost as a factor equal in importance with technical and schedule requirements through the life cycle of military hardware. Design to Unit Production Cost (DTUPC) provides specific cost goals for contractor recurring costs associated with production of an end item. Award fee is a contracting technique to provide a positive motivation to contractors to meet or beat the DTUPC set forth in the contract. This report examined the influence of award fee on contractor DTUPC achievements. The following conclusions and recommendations reflect the results of an analysis of policy and practices on DARCOM's use of DTUPC's and award fee provisions to meet the objectives of DTC.

B. CONCLUSIONS.

1. Generally, the policy for the use of DTUPC and award fees is adequately expressed in AR 70-64 and the DAR, respectively. As all too often happens, there is a wide variance between policy and practice.

2. Statistically award fee does influence achievement or betterment of DTUPC's based on the data used in this research; however, there is no statistical correlation between the percentage of award fee received and the percentage of attainment or non-attainment of DTUPC's.

3. Award fee can only have influence on achievement of DTUPC when certain factors are carefully considered and assessed. To reiterate these factors include:

a. A DTUPC which is complete, realistic, measurable, valid and achievable.

b. A clear description of the GFE interface.

- c. State-of-the-art influences.
- d. The role of production quantities.
- e. An accurate projection of baseline learning curves and production rates.
- f. The provision of adjustment factors that permit the actual DTUPC to be compared to base year figures.
- g. Data requirements for tracking DTUPC achievement.
- h. Appropriate criteria for determination of award fee earned and the establishment of an award fee pool large enough to serve as an inducement.
- i. Proper scheduling of evaluation periods.
- j. Strong management emphasis by the Government and the contractor.
- k. Effective contract performance and administration.

4. Reasonable rationales were observed for cases in which award fee, DTUPC and both provisions were deleted during contract performance.

5. Award fees on DTUPC in sole source development acquisitions are motivating if the Government is serious about possible cancellation of the program or seeking competition in the event the sole source DTUPC projections or production quantity proposals are unreasonably higher than the DTUPC goal. If the Government realistically does not have these alternatives (e.g., the threat precludes program cancellation and competition is not feasible), the Government should save the time and dollar resources devoted to award fee.

C. RECOMMENDATIONS.

1. Current policy should be amended to assure DTUPC is a source selection criterion and a major proposal evaluation and negotiation topic.

2. Award fee roll-up policy should be standardized to effect a common approach to its use.

3. Award fees should not be permitted in multiple-developer programs.

4. The DTC disciplines applied to contractor-developed hardware should be applied to Government-developed hardware.

5. Equal consideration should be given to contractual incentives other than award fee, such as priced production options, production profit incentives and production savings royalties.

6. Independent DTUPC groups should be established at HQ DARCOM and appropriate MSC's to provide the proper emphasis, expertise and adherence to policy and procedures. This function can be assigned to the organization responsible for Should Cost.

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STUDY TEAM COMPOSITION

The study team consisted of the following individuals:

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) BACKGROUND. Design to Cost (DTC) is a management concept wherein explicit cost goals are set during development. In a development contract DTC is implemented through a Design to Unit Production Cost (DTUPC) provision to insure the contractor controls costs. Since 1976 the US Army Materiel Development and Readiness Command (DARCOM) has required the application of award fee to DTUPC achievements on those programs with only one development contractor when the award fee can be expected to generate significant rewards or penalties. It was		

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determined that adequate data existed to analyze the extent to which award fee influenced DTUPC achievements. OBJECTIVES. The study objectives are to determine the extent to which award fee is used in conjunction with DTUPC and influences achievement or betterment of the DTUPC goal. Another objective is to recommend necessary changes to current policy for the application of award fee to DTUPC provisions. STUDY APPROACH. DARCOM Major Subordinate Commands (MSC's) were surveyed to obtain data on contracts with DTUPC to which award fee was and was not applied. The data was used to test the hypothesis that achievement or betterment of the DTUPC goal is independent of award fee. Contracting, technical and other personnel at DARCOM MSC's were interviewed on the influence of award fee and other factors on DTUPC achievements. Analysis of all data resulted in proposed changes to current policy for the use of award fee applied to DTUPC contract provisions. SUMMARY AND RECOMMENDATIONS. Generally, the policy for the use of DTUPC and award fees is adequately expressed in applicable regulations. Award fee has a statistically significant influence on DTUPC achievement and it can influence DTUPC achievement if the right factors are present. The factors include well-defined DTUPC, realistic adjustment factors, data requirements, evaluation criteria and weighting, determinations and award fee pool and distribution. Other factors are management emphasis and effective contract performance and administration. Recommendations include policy changes to enhance the effectiveness of DTUPC and incentives, including award fee, for motivation of contractors to meet or beat DTUPC goals.

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