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Award Fees and Their Relationship to Contract Success

June 2015

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ABSTRACT

Award fee contracts are applicable when objective criteria are neither feasible nor effective. They were heavily used to incentivize contractor performance in the procurement of major defense acquisition programs (MDAPs) until 2005, when the Government Accountability Office (GAO) released Report 06-66. The report caused the Department of Defense to shy away from using award fee contracts, resulting in a usage decrease by 46% in 2007 and 85% in 2008. The purpose of this research is to determine whether a relationship exists between award fee contracts and contract success as measured by earned value management (EVM) or contractor performance ratings. Data was collected from a sample of contracts from a major Navy command. Six contract observations were identified as successful contracts, with one contract being labeled a failure. Further analysis showed a positive correlation between award fee decisions and contractor performance ratings on the successful contracts. Although the findings are encouraging, they were not statistically significant due to the small sample size.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Award Fee Board
AFP	Award Fee Plan
CLIN	Contract Line Item Number
CPAF	Cost-Plus Award Fee
CPARS	Contractor Performance Assessment Reporting System
CPFF	Cost-Plus Fixed Firm
CPIF	Cost-Plus Incentive Fee
D&F	Determination and Findings
DAMIR	Defense Acquisition Management Information Retrieval
DFARS	Defense Federal Acquisition Regulation Supplement
DOD	Department of Defense
EMD	Engineering, Manufacturing and Development
FAR	Federal Acquisition Regulation
FDO	Fee-Determining Official
FPAF	Fixed Price Award Fee
FPIF	Fixed Price Incentive Fee
FY	Fiscal Year
GAO	United States Government Accountability Office
HCA	Head of Contracting Agency
LRIP	Low Rate Initial Production
O&S	Operations and Support
P&D	Production and Deployment
PEO	Program Executive Officer
PM	Program Manager
R&D	Research and Development
SLEPM	Sherman Lipscomb Performance Matrix
TD	Technology Development
USN	United States Navy

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I. INTRODUCTION

A. BACKGROUND

In fiscal year (FY) 2013, over 50% of the $613.9 billion Department of Defense (DOD) budget was obligated on contracts and purchase orders (Government Accountability Office [GAO], 2014). This reveals the essential role defense contracting plays in the United States' ability to prepare military forces and project power across the globe. To successfully manage contracts, contracting officers require a range of tools to produce outcomes beneficial to the government. Over the years, acquisition regulations have evolved to provide contracting professionals means to incentivize contractor performance. The two primary methods are award fees and incentive fees. According to the Federal Acquisition Regulation (FAR), incentives are designed to "motivate contractor efforts that might not otherwise be emphasized in the contract and discourage contractor inefficiency and waste" (16.401(a)(2)(ii), 2014).

Government and industry have competing contracting goals, making incentive structure in contracts a challenging endeavor. Industry's primary responsibility is to maximize the value of shareholders' wealth (Roe, 2001). Government contracting goals are to procure a quality product, at a fair and reasonable price, while meeting public policy requirements. Contract incentives need to be configured in a manner that promotes cooperative behaviors between the two parties (Brown, Potoski, & Van Slyke, 2013). For instance, if an incentive is designed to keep a program on schedule, incentives should reward early delivery and penalize schedule overruns.

Brown et al. (2013) identified two broad categories of products: simple and complex. Simple products are well-defined items, readily available on the commercial market. A simple product can be procured using a complete contract structure since both parties (buyer and seller) have a clear understanding of the product, terms, and conditions (Brown et al., 2013). Complex products are characterized by uncertainty. The product characteristics, capabilities, and cost are unknown, creating a "zone of contractual

ambiguity" between parties (Brown et al., 2013, p. 40). Properly structured incentives can influence cooperative behavior of the two parties to seek a mutually beneficial outcome.

Contract incentive fees are utilized where objective targets are developed to reward contractor cost, schedule, or technical performance goals. The amount of incentive fee a contractor earns is well defined, clearly identifying the value received by the government. Contract award fees are similarly applied; however, contractor performance is based on subjective targets, making their effectiveness as a motivating force more ambiguous. This research contends that it is possible to quantify award fee outcomes by using associated measures of contract success, such as earned value management (EVM) or contractor performance ratings.

Award fee contracts are synonymous with expensive, major defense acquisition programs (MDAPs), increasing their exposure to inquiry and analysis (GAO, 2005). They are intended to improve government-contractor relationships, enhance cooperative behavior, and drive towards a win-win exchange (Brown et al., 2013). The amount of award fee a contractor earns is determined by award fee criteria established in the award fee plan. The criterion is subjective, resulting in award fee payment scrutiny by government oversight organizations, causing award fees to fall in and out of favor despite their usefulness. In 1992, the Government Accountability Office (GAO) identified award fees as a contributing factor to contract management being a high-risk category within the DOD (GAO, 2015). The GAO (2005) argues that the way the DOD implements award fee contracts are ineffective because they do not hold contractors accountable, fall short of motivating contractor performance, and are not linked to desired outcomes. In response to these reports, the DOD enacted policy measures to improve implementation of award fees. This research analyzes contracts awarded after the DOD policy changes to see if a relationship exists between award fees earned by contractors and contract success. The next section discusses the purpose of this research.

B. PURPOSE OF RESEARCH

The purpose of this research is to determine if a relationship exists between award fee contracts and contract success as measured by earned value management (EVM) or

contractor performance ratings. Prior government assessments, such as GAO Report 06-66, titled *Defense Acquisitions: Department of Defense (DOD) Has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcomes* (GAO, 2005), left a negative perception of award fee usefulness. This research suggests award fees are a vital tool for program offices and contracting officers and can be linked to contract success. Award fee contracts are a means for the contractor and government to mitigate risk in administering a program (Rendon & Snider, 2008). A sample of award fee contracts is analyzed to establish a framework to relate award fees to contract success. Where successful contract relationships are identified, further trend analysis is conducted to find correlation with other contract elements, such as contract dollar value, procurement type, source selection criteria, and acquisition life-cycle phase of the program.

GAO (2005) based the findings in Report 06-66 on the overall system cost, schedule, and technical performance outcomes that can be influenced by a multitude of factors. It can be argued that approach lacked in-depth analysis of the award fee plans and award fee criteria used to make award fee decisions. A review of these elements could provide greater insight into the existence of a relationship between award fee decisions and contract success. Identifying the relationship award fee decisions have with contract success can determine whether award fees are effective contracting tools. The next section introduces the research questions used to guide this study.

C. RESEARCH QUESTIONS

The following research questions guided data collection and analysis of this study. The research questions are listed along with a brief explanation of why that question was selected and what results it was expected to yield.

1. How are Award Fee Decisions and EVM Related?

This question analyzes the relationship between earned value management (EVM) as a management metric and award fee decisions. EVM is used as an early warning indicator of program cost, technical performance, and schedule issues. The use of EVM is required for the procurement of major systems or capital assets, to manage risk during the acquisition process (FAR 34.005-2(b)(6)). EVM metrics are submitted at a minimum on a

monthly basis and provide a snapshot of contractor performance to support award fee decisions. EVM provides an objective measure of cost and schedule to compare with subjective award fee decision criteria. By analyzing this relationship it can be shown whether award fee decisions were synchronized with program cost, technical performance, or schedule outcomes.

2. How are award fee decisions and contractor performance related?

This question examines the relationship between award fee decisions and contractor performance ratings. During each contract performance period, the government is required to conduct an evaluation of how that contractor performed. These assessments establish the contractor's performance rating and are heavily factored into whether a contractor receives future contract awards. The timing of performance rating submissions and award fee decisions do not exactly match, but will have significant periods of performance overlap. A prior study was conducted to measure contractor performance ratings with successful contracts. The model developed by that study is utilized to quantify the relationship between award fee decisions and contractor performance ratings in this study. The model is further discussed in Chapter 3, under the Contractor Performance Rating section.

3. How are Successful Contracts, as Identified by EVM and Contractor Performance Ratings, Related to Other Contract Elements?

The first two questions identify successful contracts based on EVM and contractor performance rating. For those contracts that were characterized as "successful," this research question analyzes contract structure to determine whether any trends exist. For instance, if a contract element appears multiple times in successful award fee contracts, it is an indicator of future contract success under similar circumstances.

D. SCOPE AND LIMITATIONS

The scope of this research is to analyze cost-plus award fee (CPAF) and fixed price award fee (FPAF) contracts. Government contracting utilizes other incentive type

contracts, but those are objective in nature, with a clear definition of use and success. CPAF and FPAF contracts utilize subjective grading criteria, making the relationship between award fee decisions and contract success more difficult to measure. Construction contracts have specific procedures that are not pertinent to this study and are therefore omitted. This research focuses solely on service and material contracts with at least one award fee contract line item number (CLIN).

The study is limited by the size of the sample. Only contracts from one Navy command were reviewed. The Navy command had a total sample of 31 contracts that used award fee CLINs between 2008 and 2014. Of those 31 contracts, 13 contracts were selected for data analysis. Award fee decisions were only available for seven of the 13 selected contracts. The smaller contract sample size increases the margin of error with regard to the data representing the award fee contract population as a whole.

Another limitation is that the study examined contracts from one of four possible DOD services (the Navy). The Air Force, Army, and Marine Corps are other DOD organizations that use award fee contracts. Each service has unique procurement requirements; thus, not analyzing all of the services may not accurately characterize the relationship between award fee decisions and contract success across the entire DOD. Moreover, only data from one Navy command was gathered. There are multiple Navy contracting commands, meaning the relationship between award fee decisions and contract success within the Navy could vary.

Award fees could be used in conjunction with another incentive tool which creates a study limitation. Contracts could use both award and incentive fees, making it difficult to isolate the degree to which the award fee or the other incentive is making the contribution to contract success. This study acknowledges the existence of such possibilities, but does not have the means to segregate the influencing factors.

The availability of data was discovered to be a limitation during the data gathering phase. Earned value management data was not available at the sub-component level for major systems; it was only available for the overarching program. Contractor performance ratings and award fee decision time periods could not be precisely aligned.

For instance, there were close-out contractor performance ratings that encompassed the entire contract performance periods, but all the award fee decisions for the same period were not available. In those instances, the award fee decisions were averaged to represent an overall award fee decision for the entire period.

The last study limitation is due to causal factors external to the contractor. In some cases the government can be responsible for schedule, performance, or cost changes in a program. Those changes could affect the contractor performance rating and impact program cost and schedule outcomes. It is undeterminable how to account for these influencing factors in the study. The next section provides the organization of the paper.

E. ORGANIZATION OF THE PAPER

This paper is organized in five chapters: Introduction, Literature Review, Methodology, Data Presentation, and Summary and Conclusion. The first chapter covers the introduction to the topic, lists the research questions to be analyzed, and provides the scope, limitations, and assumptions. The second chapter is a literature review of the topic. It describes the history of government award fee contracts, summarizes previous research on the topic to establish a foundation, and discusses current award fee policies. The methodology section in Chapter III provides a research road map. It details how data was gathered and recorded for analysis. The fourth chapter discusses research findings and provides interpretation of the results. The results provide implications for future use of award fee contracts. Chapter IV also provides answers to the research questions. Chapter V is the summary and conclusion, where the entire research paper is synopsized. This chapter also provides areas for further research.

F. SUMMARY

This chapter presented an introduction to the research. The first section provided a brief background on award fees to establish a foundational knowledge on the subject. The next section introduced the purpose of the research that guided research question selection and data collection. The three research questions were then listed; each research question included an explanation of what that question was designed to uncover. Next, the research scope and limitations were provided. This section explained the parameters

in which the research was conducted. The last section showed how the research paper is organized. The next chapter provides a literature review of award fee contracts in government acquisition.

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II. LITERATURE REVIEW

> With DOD spending over $200 billion annually to acquire products and services that include everything from spare parts to the development of major weapon systems, our numerous, large, and mounting fiscal challenges demand that DOD maximize its return on investment and provide the warfighter with needed capabilities at the best value for the taxpayer. In an effort to encourage defense contractors to perform in an innovative, efficient, and effective way, DOD gives its contractors the opportunity to collectively earn billions of dollars through monetary incentives known as award and incentive fees. Using these incentives properly, in concert with sound acquisition practices, is a key to minimizing waste, maximizing value, and getting our military personnel what they need, when and where they need it. Unfortunately, DOD has not used these incentives effectively.
>
> —Testimony of the Comptroller General of the United States to the Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate (GAO, 2006, p. 1)

A. INTRODUCTION

This chapter offers an overview of award fee contracts utilized in government procurement. Award fee contracts have been a preferred contract vehicle for motivating contractor performance, subject to scrutiny regarding effectiveness, and regulated by recent audit reports. Recent audits from the GAO questioned the effectiveness of the DOD's use of award fees. The DOD responded to the GAO audits by implementing policy changes, developing a community of practice to share lessons learned, and revising training of its acquisition workforce. This chapter discusses the theory behind award fee contracts, describes the government contracting process, summarizes the current policy that governs award fees, highlights the history of award fees, summarizes recent issues identified in GAO reports, and reviews the DOD's response to GAO audits.

B. PURPOSE AND GOALS OF AWARD FEES

The government and private sector use bonuses to incentivize performance objectives in business to business contracting arrangements. These bonuses are structured

to motivate performance such as early delivery, higher quality, or lower costs. One salient example of a state government using bonuses in a fashion similar to an award fee is in the contract for interchange repair work done on the I-580 interstate in Oakland, California. Patrick May reported in the *San Jose Mercury News* (2007) reported that a section of the interchange collapsed after a fuel tanker caught on fire and melted the steel structure under the interchange. The California Department of Transportation (Caltrans) awarded a contract to C.C. Meyers to repair the collapsed section. Erik Nelson of the *San Jose Mercury News* (2007) summarized the contract by reporting "Caltrans awarded a contract for $867,075 to a Rancho Cordova company—along with the promise of up to $5 million in incentives for finishing early." This incentive of a $200,000-a-day bonus was structured to motivate CC Meyers to complete work ahead of schedule. May reported that the interchange was opened 32 days ahead of schedule and resulted in CC Meyers earning the full $5 million bonus (May, 2007). Private industry uses similar incentive structures.

The private industry uses various forms of incentives structures in contracts to motivate contractors towards desired objective outcomes. Bower, Ashby, Gerald, and Smyk (2002) conducted a study on the use of incentive mechanisms in project success. They identified that firms use incentives to align firms' objectives and the contractors' objectives, for risk allocation, and create appropriate contractor involvement (Bower, Ashby, Gerald, and Smyk, 2002). Their study used three construction related contracts: (1) offshore design, procurement, and construction; (2) systems, applications, and products (SAP) implementation; and (3) plant maintenance support services. Bower, et al. (2007) identified that the contracts were structured to meet "project cost, schedule, and quality objectives" (p. 7). Further, their study concluded that the contract structures and incentives used in the subject contracts resulted in performance that exceeded the firms' objectives (Bower et al., 2007). The incentive structures used in the subject contracts included award fee type of bonuses to motivate the contractor to align their objectives with the firms, resulting in exceptional performance.

This theme of alignment is not new. Raymond Hunt (1985) identified a need for a flexible incentive mechanism that would align governmental and contractor objectives in

procurements involving complex contracts with great uncertainty in terms of requirements definition. Hunt introduced a joint model (J-model) methodology that involved the use of award fee contracts to achieve this alignment (Hunt, 1985). He identified the award fee contract as "a continuing framework for negotiating and planning the evolving design, development, and management of dynamic program organizations and operations wherein the contract (as a plan for performance) is not categorically divorced from its downstream modes of administration" (Hunt, 1985, p. 589). This framework provides that award fee contracts can be structured to align governmental and contractor objectives through cooperation by providing incentives, establishing periods of communication during evaluation, and allowing flexibility in redefining objective priorities throughout the term of the contract. This framework, Hunt's J-model to program management, allows the flexibility for managers to motivate contractors towards exceptional performance.

The introductory quote, at the beginning of this chapter, from the comptroller general highlights the main premise behind awards and incentives: to provide an incentive to a contractor to achieve specific acquisition objectives by performing in an innovative, effective, and efficient manner. The government contracting environment reflects the buyer-supplier relationship that is often informed in the economic literature by agency theory (Rendon, 2011). In government contracting, the government is the principal, and the contractor is an agent (Rendon, 2011). Both the government and contractor are parties in an exchange that is governed by the principal-agent problem or agency theory (Rendon, 2011). The next few paragraphs addresses the objectives and behaviors of the parties, examines the conflicting objectives of the parties, discusses the relation of mutual understanding by product or service and contract type, explores possible behavior combinations each party may take, uses game theory's prisoner's dilemma to examine the behavior outcomes, and discusses contract rules and relationship mechanisms that can motivate win–win outcomes.

Contractors in government procurement typically represent private or public firms. Some possible objectives of these firms include earning a profit, capturing market share, growing the business, or maintaining cash flow (Rendon, 2011). These objectives

are met in government procurement contracts by receiving monetary compensation for their efforts in delivering a product or service. In contrast, the principal is the government. The government's objectives might include meeting public policy goals such as supporting small businesses, obtaining goods or services at a fair and reasonable price, and maintaining a viable industrial base; procuring the customers requirement in a timely manner; and ensuring the product or service meets the customer's quality and technical specification standards (Rendon, 2011). The principal and agent's objectives are often at odds, motivating each party to withhold or share information in accordance with their individual interests (Rendon, 2011). Further, Rendon (2011) identifies that:

> Agency theory is concerned with the conflicting goals between principal and agent in obtaining their respective objectives and is focused on mechanisms related to obtaining information (for example about the marketplace, the supply or service, or the contractor), selecting the agent (to counter the problem of adverse selection), and monitoring the agent's performance (to counter the effects of moral hazard). (p. 7)

The amount of information either side has depends on the type of product or service being procured.

The types of products the government procures can be defined in two main groups being either simple or complex. Brown et al. (2013) define simple products as ones in which "their important attributes can easily and clearly be spelled out in advance and can be unambiguously verified once the product or service has been delivered (p. 12). Classic examples of simple products include consumable supplies and commercially available products that are sold in wide markets. In contrast, Brown et al. (2013) define complex products as ones that "have important qualities that cannot be easily and clearly spelled out in advance and are difficult to verify after the product has been delivered" (p. 12). The difficulty in verifying delivery and uncertainty in defining requirements allows for the greater potential in information asymmetry between the principal and the agent (Brown et al., 2013).

Brown et al. (2013) provided a good example of the primary type of product and contract type that suit the use of award fees. They stated that complex products which involve complex exchanges with complex contracts are more likely to result in

information asymmetry requiring some form of incentive to motivate either party's behavior to cooperate (Brown et al., 2013). A complex product is not well-defined in terms of specifications and performance (Brown et al., 2013). These complex products require complex exchanges due to a high level of uncertainty regarding the product's performance, delivery, and cost attributes that often leads to specialized investment by each party (Brown, 2013). The complex products and exchanges lead to complex contracts that are incomplete due to the low level of specificity and increased flexibility regulating each party's behavior (Brown, 2013). The contracts are incomplete in regards to the terms and conditions that regulate the contract. The uncertainty, specialized investment, and low level of specificity allow each party more flexibility and discretion to behave in pursuit of self-interest (Brown, 2013). This flexibility and discretion to act in self-interest can lead to behavior that results in other than win–win outcomes.

There are many combinations of behavior that can result in other than win–win outcomes. Consummate, or cooperative, behavior results when both parties choose to behave in a manner that is not individually optimal, but is optimal for the combined relationship (Brown, 2013). Alternately, perfunctory, or uncooperative, behavior occurs when each or one party pursues its own interests even at the greater expense to the other (Brown, 2013). The prisoner's dilemma provides a sound explanation and depiction of the possible behavior combinations and their associated outcomes.

The prisoner's dilemma is a principle of game theory that depicts a set of exchanges between two parties (Brown, 2013). The buyer (government) and seller (contractor), engage in a set of exchanges that have the option to cooperate or to defect. The amount of payoff each receives is determined by how the other party behaves. If the buyer and seller both defect, they receive the lowest payoff. If one party defects while the other party cooperates, the defecting party benefits at the cooperating party's expense. The highest combined payoff occurs when both parties cooperate. Table 1 depicts the possible combinations of behavior along with the associated outcomes.

Table 1. The Prisoner's Dilemma

BUYER / SELLER	COOPERATE	DEFECT
COOPERATE	WIN–WIN **(COOPERATIVE)** ***LARGEST COMBINED PAYOFF***	WIN–LOSE **(UNCOOPERATIVE)** ***MODERATE COMBINED PAYOFF***
DEFECT	LOSE–WIN **(UNCOOPERATIVE)** ***MODERATE COMBINED PAYOFF***	LOSE–LOSE **(UNCOOPERATIVE)** ***SMALLEST COMBINED PAYOFF***

Note. Relationships are depicted as buyer-seller; i.e., win-lose means buyer wins, seller loses.

In the prisoner's dilemma, there is an incentive for individual parties to defect because they stand to potentially realize a larger win if the other party cooperates. If they both do not cooperate, they both lose and realize a smaller pie. If they both cooperate, they both win and there is a larger pie. The challenge in complex contracting is to structure contracts and contract relationships in a manner that incentivizes each party to choose cooperative behavior instead of seeking self-interest (Brown, 2013).

One of the solutions to fix the prisoner's dilemma in complex contracting is to use performance incentives to "narrow the range of discretionary behavior, thereby mitigating but not eliminating complex contracting's lose-lose potential" (Brown, 2013, p. 144). In order for performance incentives to be effective, Brown (2013) stated that they "need clearly defined standards, objectively measured and commonly understood by the buyer and seller, and adequately backed by properly scaled sanctions and rewards" (p. 143). Award fees are a form of incentive contracting aimed at motivating contractor performance towards a specific acquisition objective. To be in line with Brown's (2013) assessment of effective performance incentives, award fees must have clearly defined award fee criteria that is linked to specific acquisition outcomes, must have clearly defined methods for performance evaluation that is objective, and must have award fee pool amounts that are commensurate with incentivizing contractor performance towards

desired outcomes. Award fee contracting is discussed in more detail in Section D of this chapter. The next section addresses the key functions of the phases of the government contracting process and how they relate to award fees.

C. CONTRACT MANAGEMENT PROCESS

The government contract management process consists of six phases: procurement planning, solicitation planning, solicitation, source selection, contract administration, and contract closeout or termination (Rendon & Snider, 2008). A comprehensive review of all the facets of each phase is beyond the scope of this project. Chapter 10 in Rendon and Snider's (2008) *Management of Defense Acquisition Projects* and Chapter 3 in Garrett's (2010) *World Class Contracting* provide a comprehensive review of each phase. This section addresses key functions of each phase as they relate to award fee contracting.

1. Procurement Planning

Procurement planning is the process of reviewing the customer's requirement to determine a make-or-buy decision, identifying a contract type, and developing a description of the product. For government contracting, the make-or-buy decision typically involves deciding between buying a commercial product, outsourcing the development of a product, or leveraging in-house capabilities to develop a product. The make-or-buy decision influences the selection of a contract type based on the level of performance risk. Commercial items are procured with firm-fixed-price type contracts due to their low risk of performance. Developmental products that involve uncertain or broadly defined performance requirements are better suited to cost-reimbursement contracts. This process is informed by information and analysis gathered during market research. Market research helps define what capabilities and products currently exist in the marketplace to meet the customer's requirement and can help define the requirement. Additionally, the results of the market research and definition of the customer's requirement inform the source selection strategy. If the requirements are definitively known and the product or service is readily available in the market with little variation amongst competitors, a lowest price technically acceptable (LPTA) source selection

process is suitable (Rendon & Snider, 2008). In contrast, contracting policy allows for a tradeoff process for products or services if it is determined that best value can be obtained through an "award to other than lowest priced offeror or other than the highest technically rated offeror" (FAR 15.101). The procurement planning phase concludes with the development of a requirements document that defines the product characteristics and a procurement management plan. For award fee contracts, the development of a requirements document aids in determining the viability of award fee criteria to motivate the contractor towards an acquisition objective.

2. Solicitation Planning

The solicitation planning phase consists of documenting the procurement method; determining contract type; developing the solicitation document; determining proposal evaluation criteria and contract award strategy; structuring contract terms and conditions; and finalizing solicitation documents (Rendon & Snider, 2008). Award fee contracts may use sealed bidding procedures as governed by FAR Part 14, *Sealed Bidding* or negotiated procurement procedures as governed by FAR Part 15, *Contracting by Negotiation*, as well as sole source. A cost–benefit analysis must be conducted to ensure that the anticipated benefits from the award fee outweigh the additional administrative costs. The contract type is either CPAF or FPAF. The remaining elements of the solicitation planning phase result in the development of an award fee plan that identifies the award fee criteria, methods of evaluation, method of fee determination, and organizational structure for award fee administration. The solicitation planning phase concludes with the finalization of solicitation documents, to include the award fee plan.

3. Solicitation

The solicitation phase consists of advertisement of the procurement opportunity; conducting pre-proposal conferences, if required; and developing and maintaining a qualified bidder's list (Rendon & Snider, 2008). Typically, for any contract action exceeding $25,000, the solicitation must be synopsized and posted in the government-wide point of entry known as federal business opportunities (FedBizOpps) (FAR 5.1).

The award fee plan is included as an attachment to the request for proposal. Responding offerors submit proposals for evaluation during the source selection phase.

4. Source Selection

The source selection phase consists of evaluation of proposals against evaluation criteria; negotiations with suppliers; and execution of the award strategy (Rendon & Snider, 2008). Negotiated award fee contracts involve exchanges between buyers and sellers to clarify and come to agreement on terms and conditions; cost, schedule, and performance objectives; and other unique contract items relevant to individual contracts. The source selection phase concludes with the award of the contract to the selected source.

5. Contract Administration

According to Rendon and Snider (2008), the contract administration phase typically includes "conducting a pre-performance conference, monitoring the contractor's work results, measuring contractor's performance, and managing the contract change-control process" (p. 176). The buyer and seller review the award fee plan during the pre-performance conference to ensure mutual understanding of the award fee criteria, the evaluation methodology for the criteria, and the periods of performance during which the criteria are reviewed. The buyer uses performance monitors to track and document seller performance against the agreed upon evaluation criteria. Depending on the structure of the award fee performance evaluation plan, contractors may submit self-assessments to aid in award fee evaluation. The performance monitor's assessments and, if applicable, the contractor's self-assessment are reviewed by the award fee evaluation board. The award fee evaluation board (AFEB) provides an assessment and recommends award fee amount to the fee determining official (FDO) for consideration. The FDO considers the AFEB assessment and recommendations and makes a final determination of the fee amount. The determined fee is awarded to the contractor through a contract modification by the contracting officer. Each award fee period of performance follows this process until contract completion or termination.

6. Contract Closeout or Termination

Contract performance can end for different reasons. Despite the method of contract conclusion, all contracts must be closed out. The contract closeout phase "includes activities such as the processing of government property dispositions, final acceptance of products or services, final contractor payments, and documentation of contractor's final past performance report" (Rendon & Snider, 2008, p. 180). The final award fee is paid to the contractor through a contract modification. The contractor's performance is documented in the Contractor Performance Assessment Reporting System (CPARS), and the remaining activities in contract closeout are completed. The contracting officer uses the Department of Defense Form 1597, Contract Closeout Checklist to verify completion of all closeout activities. The next section discusses the government policy on award fee contracts.

D. CONTRACT STRUCTURE ELEMENTS

This study focuses on the following contract structure elements: contract type, acquisition life-cycle phase, source selection method, product type, and contract total dollar value. The following is a summary of each contract structure element mentioned.

1. Contract Type

Defense contracts fall into two general types: cost-reimbursement and fixed-price (FAR 16.101). Cost-reimbursement contracts pay the contractor for allowable costs they incur. The contractor can be reimbursed up to a predetermined ceiling cost. Fixed-price contracts pay the contractor a negotiated amount regardless of what costs they incur. Award fees can be incorporated in both cost-reimbursement and fixed-price contracts. In both instances, award fees provide for an additional profit to be made if the contractor meets predetermined criteria.

2. Acquisition Life-Cycle Phase

According to Cochrane and Brown (2010), there are five phases programs progress through: (1) Material and Solution Analysis Phase, (2) Technology Development Phase, (3) Engineering & Manufacturing Development Phase, (4)

Production & Deployment Phase, and (5) Operations & Support Phase. In general, the first two phases involve research and development of material solutions for a requirement. The system parameters are not well-defined and are still being tweaked. In Phase 3, the Engineering & Manufacturing Development Phase, a material solution is identified and designed to fulfill the requirement. In the last two phases, the system is refined, built, fielded and supported until disposal. Early life-cycle phases have the greatest risk as solutions are being developed (Allen, 2008). Over time, risk will decrease and become manageable as the solution enters the Production & Deployment phase.

3. Source Selection Method

The criteria to select the best contract offer are either lowest price technically acceptable (LPTA) or trade-off/best value. For LPTA, the contractor with the lowest price offer that meets the government minimum requirement is selected. Price/cost is the determining factor for selecting the winning bidder. For best value strategies, trade-offs can occur between cost, price, and other non-price factors, such as past performance and technical capability (FAR 15.101). A best value selection affords the government the opportunity to select a contractor on criteria other than solely price/cost.

4. Product Type

Contracts can be used to procure two general product types, services or material. This study does not consider a third product type, construction contracts. Award fee contracts are used for all product types, but are well suited for complex products, as discussed in section B. (Purpose and Goals of Award Fees) of this chapter.

5. Contract Dollar Value

Award fee contracts increase administration requirements, making their applicability to smaller dollar value contracts less beneficial. A large dollar value contract better justifies the increased administrative cost associated with award fee contracts. Considerations for the use of award fee contracts are further discussed in the next section.

E. GOVERNMENT POLICY ON AWARD FEE CONTRACTS

This section discusses the statutory and regulatory policies that govern award fee contracts. The FAR, the Defense Federal Acquisition Regulation Supplement (DFARS), and the DFARS-Procedures, Guidance, and Information (PGI) serve as the primary sources of policy for government contracting. This policy review focuses on the following topics: general policy and definition of incentive contracts, general policy on award fee contracts, CPAF policies, and FPAF policies.

1. General Policy and Definition of Incentive Contracts

The FAR defines award fee contracts as a type of incentive contract. FAR 16.401 adds that incentive contracts:

> are appropriate when a firm-fixed-price contract is not appropriate and the required supplies or services can be acquired at lower costs and, in certain instances, with improved delivery or technical performance, by relating the amount of profit or fee payable under the contract to the contractor's performance.
>
> The FAR requires that:
>
> Incentive contracts are designed to obtain specific acquisition objectives by—
>
> (1) Establishing reasonable and attainable targets that are clearly communicated to the contractor; and
>
> (2) Including appropriate incentive arrangements designed to—
>
> > (i) motivate contractor efforts that might not otherwise be emphasized; and
> >
> > (ii) discourage contractor inefficiency and waste. (FAR 16.401)

This policy ensures that the added costs provide incentives to motivate contractor performance towards a specific government acquisition objective. FAR 16.4 clarifies this by requiring that, for formula-type incentives, incentives are applied to performance that exceeds the minimum performance requirement. The FAR does not allow incentive payments for expected or minimum performance on these types of incentive structures but does for award fee incentives. The FAR allows for incentives on fixed-price or cost-

reimbursement contracts. DFARS 216.4 requires the use of objective criteria, associated with cost-plus-incentive-fee and fixed-price-incentive-fee contracts, to be used to the maximum extent possible. The DFARS adds that when both subjective and objective incentives are in the best interest of the Government, a multiple-incentive contract structure should be used. Additionally, the FAR requires that a determination and finding (D&F) is completed for all incentive and award fee contracts. The D&F must provide the justification for the use of the incentive or award fee contract as "in the best interest of the Government" (FAR 16.401(d)). The FAR provides more detailed guidance on award fee contracts, as discussed in the next section.

2. General Policy on Award Fee Contracts

The FAR identifies policies for the application of award fees, determination of award fee amount, administrative requirements for the award fee plan, rollover of unearned fees, and limitations on awarding the award fee. This section addresses each of these policy elements and incorporates regulatory guidance from the DFARS and DFARS-PGI.

3. Application of Award Fees

The FAR identifies certain conditions in which award fees are suitable for use. According to the FAR, award fees are suitable when the following conditions exist:

> (i) The work to be performed is such that it is neither feasible nor effective to devise predetermined objective incentive targets applicable to cost, schedule, and technical performance;
>
> (ii) The likelihood of meeting acquisition objectives will be enhanced by using a contract that effectively motivates the contractor toward exceptional performance and provides the Government with the flexibility to evaluate both actual performance and the conditions under which it was achieved; and
>
> (iii) Any additional administrative effort and cost required to monitor and evaluate performance are justified by the expected benefits as documented by a risk and cost benefit analysis to be included in the Determination and Findings referenced in 16.401(e)(5)(iii). (FAR 16.401, (e)(1))

The first condition reinforces the incentives general policy requirement to consider objective criteria first when developing incentive contracts. DFARS-PGI 216.4 requires that contracting officers consult with PMs and FDOs when developing award fee plans for contracts that will not use objective criteria. This condition also addresses the requirement to link incentives to specific acquisition objectives such as cost, schedule, and technical performance. The DFARS-PGI further requires that the "award fee criteria shall be linked directly to contract cost, schedule, and performance outcome objectives" (DFARS 216.401 (e)(i)).

The next condition requires analysis of the likelihood of the award fee to motivate contractors to achieve the government's specific acquisition objective. The DFARS-PGI offers guidance to assist in this analysis by requiring that

> award fees must be tied to identifiable interim outcomes, discrete events or milestones, as much as possible. Examples of such interim milestones include timely completion of preliminary design review, critical design review, and successful system demonstration. In situations where there may be no identifiable milestone for a year or more, consideration should be given to apportioning some of the award fee pool for a predetermined interim period of time based on assessing progress toward milestones. In any case, award fee provisions must clearly explain how a contractor's performance will be evaluated. (DFARS 216.401(e)(1))

Linking award fees to these interim outcomes, events, or milestones increases the likelihood that the fee will motivate the contractor to exceptional performance. The key to achieving the likelihood of meeting acquisition objectives is clearly defining the objective, how performance towards the objective will be achieved, and ensuring that the award fee provides an adequate incentive to motivate the contractor towards exceptional performance.

The last condition requires the identification of additional administrative costs associated with the award fee and an analysis of that cost against the expected benefit. Monitoring and evaluation of award fee criteria requires additional administrative efforts. The FAR requires that these efforts are monetized and compared against a monetized valuation of the anticipated benefits. In addition, the FAR requires a risk assessment to determine the likelihood and impact of a contractor not meeting the award fee criteria.

The cost–benefit analysis and risk assessment are required elements in the D&F for the award fee. If the previous three conditions are satisfied, the amount of the award fee is determined using the policy discussed in the next section.

4. Determination of Award Fee Amount

The FAR and DFARS provide guidance and limitations on the amount of award fee to be earned. The FAR requires that the award fee is "commensurate with the contractor's overall cost, schedule, and technical performance as measured against contract requirements in accordance with the criteria stated in the award fee plan" (16.401(e)(2)). Linking the amount of the award fee to the cost, schedule, and technical performance requires a cost–benefit analysis to ensure that the amount of the award fee is likely to motivate contractor's performance to achieve desired acquisition outcomes. The DFARS provides further restrictions on the amount of the award fee by requiring the establishment of an award fee pool. The award fee pool is the total amount of the possible award fee that could be earned during an award fee evaluation period. The DFARS requires that "at least 40 per cent of the award fee is available for the final evaluation so that the award fee is appropriately distributed over all evaluation periods to incentivize the contractor throughout performance of the contract" (DFARS 216.405-2(1)). Additionally, the DFARS requires that, if a base fee is used, base fees must be less than 3% of the estimated contract cost. The FAR requires that the basis of award fee determinations be documented in contract files. In addition to documentation, the FAR requires that the award fee determinations ensure that contractor performance is at or above a satisfactory level, as described in the award fee criteria in the award fee plan. These policies are aimed at ensuring the linkage between award fees earned and contractor performance towards desired acquisition objectives. The criteria and process for the award fee amount is described in each contract's award fee plan.

5. Administrative Requirements for the Award Fee Plan

The FAR requires that all contracts that include award fees have an award fee plan and an award fee board. The award fee plan establishes the award fee evaluation

procedures, and the award fee board conducts the evaluation. According to the FAR, the award fee plan must

> (i) Be approved by the FDO unless otherwise authorized by agency procedures;
>
> (ii) Identify the award fee evaluation criteria and how they are linked to acquisition objectives which shall be defined in terms of contract cost, schedule, and technical performance. Criteria should motivate the contractor to enhance performance in the areas rated, but not at the expense of at least minimum acceptable performance in all other areas;
>
> (iii) Describe how the contractor's performance will be measured against the award fee evaluation criteria;
>
> (iv) Utilize the adjectival rating and associated description as well as the award fee pool earned percentages shown below in Table 2 [FAR, Table 16-1]. Contracting officers may supplement the adjectival rating description. The method used to determine the adjectival rating must be documented in the award fee plan;
>
> (v) Prohibit earning any award fee when a contractor's overall cost, schedule, and technical performance in the aggregate is below satisfactory;
>
> (vi) Provide for evaluation period(s) to be conducted at stated intervals during the contract period of performance so that the contractor will periodically be informed of the quality of its performance and the areas in which improvement is expected (*e.g.* six months, nine months, twelve months, or at specific milestones);
>
> (vii) Define the total award fee pool amount and how this amount is allocated across each evaluation period. (FAR 16.401(e)(3))

Table 2. FAR Adjectival Rating Scale

Award Fee Adjectival Rating	Award Fee Pool Available To Be Earned	Description
Excellent	91%-100%	Contractor has exceeded almost all of the significant award fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award fee plan for the award fee evaluation period.
Very Good	76%-90%	Contractor has exceeded many of the significant award fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award fee plan for the award fee evaluation period.
Good	51%-75%	Contractor has exceeded some of the significant award fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award fee plan for the award fee evaluation period.
Satisfactory	No Greater Than 50%	Contractor has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award fee plan for the award fee evaluation period.
Unsatisfactory	0%	Contractor has failed to meet overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award fee plan for the award fee evaluation period.

These policies establish the rules for the identification of award fee criteria, how the contractor's performance will be measured against the criteria, how performance will be evaluated, and defines the award fee amounts by evaluation period. In addition, these policies provide guidance on how to structure the criteria to ensure they are tailored to ensure award fees are given for satisfactory or better contractor performance towards specific acquisition criteria linked to cost, schedule, and technical performance. The FAR adds further restrictions and limitations to award fee use as discussed in the next two sections.

6. Rollover of Unearned Fees

The term *rollover* refers to the reallocation of unearned award fee amounts during one evaluation period to a subsequent evaluation period. For example, if a contractor's

performance is evaluated to be very good and earns 90% of the evaluation periods award fee pool, 10% is left unearned. Previous policy allowed FDOs to reallocate the unearned 10% of the award fee pool to future evaluation periods. This reallocation is termed *rollover*. Allowing this rollover diminishes the power of the award fee incentive to motivate contractor performance. A contractor may not concern themselves with meeting acquisition objectives in one evaluation period if they believe that they will have a second chance at earning the award fee in a subsequent period. The FAR currently prohibits the use of unearned award fees (FAR 16.401(e)(4)).

7. Award Fee Limitations

The FAR limits the use of award fee contracts by requiring the completion of an award fee plan and a D&F. In addition, for CPAF contracts, the limitations that are applicable to cost-reimbursement contracts must be satisfied. FAR limitations on cost-reimbursement contracts include: must have an adequate contractor's accounting system; must receive appropriate government surveillance to ensure efficient methods and effective cost control by the contractor; and must not be a commercial item. The cost-reimbursement contract limitations only apply to CPAF contracts, not FPAF contracts. The award fee plan requirements were discussed previously in the administrative requirements for the award fee plan section. The D&F requirements for award fees were discussed previously in the general policy and definition of incentive contracts section. These limitations restrict the situations in which award fee contracts shall be used. There are two types of award fee contracts, CPAF and FPAF, which are detailed in the next two sections.

8. Cost-Plus Award Fee Contract Policies

The GAO (2009b) identified that 94% of award fee contracts in 2008 were cost-plus award fee (CPAF) contracts. The FAR defines a CPAF as

> a cost-reimbursement contract that provides for a fee consisting of (1) a base amount fixed at inception of the contract, if applicable and at the discretion of the contracting officer, and (2) an award amount that the contractor may earn in whole or in part during performance and that is

> sufficient to provide motivation for excellence in the areas of cost, schedule, and technical performance. (FAR 16.405-2)

The general policies and limitations on award fee contracts outlined in previous sections apply to CPAF contracts as well. In addition to those policies and limitations, the DFARS provides additional policies for CPAF contracts.

The DFARS limits the use of CPAF contracts by restricting their use such that they are not used to avoid establishing objective targets that could be used in cost-plus-incentive-fee (CPIF) contracts; to avoid establishing CPFF contracts when corresponding criteria can be established; nor for engineering development or operational system development contracts in which requirements allow for simultaneous R&D and production. The DFARS does, however, allow CPAF contracts for

> individual engineering development or operational system development acquisitions ancillary to the development of a major weapon system or equipment, where—
>
> (1) It is more advantageous; and
>
> (2) The purpose of the acquisition is clearly to determine or solve specific problems associated with the major weapon system or equipment. (DFARS 216.405-2(3)(B))

These limitations support the policy to prioritize the use of objective criteria and evaluation methods to incentivize specific acquisition objectives before using subjective measures. This policy guides contracting officers to use objective incentive contract vehicles such as CPIF, fixed-price-incentive-firm (FPIF), or CPFF when objective criteria and evaluation methods can be established. The DFARS does not allow the use of the weighted guidelines method to determine the base fee or the award fee. Lastly, the DFARS-PGI provides guidance on contractor performance evaluation through example performance evaluation criteria and a sample performance evaluation report in Part 216.470. The FPAF contract policies are discussed in the next section.

9. Fixed-Price Award Fee Contract Policies

The FAR provides very little guidance on the use of FPAF contracts. In general, fixed-price contracts place a majority of the cost risk on the contractor. Therefore, the

objective of FPAF contracts is typically to incentivize technical performance or delivery. FAR Part 16.404 provides the following guidance:

> Award fee provisions may be used in fixed-price contracts when the Government wishes to motivate a contractor and other incentives cannot be used because contractor performance cannot be measured objectively. Such contracts shall establish a fixed price (including normal profit) for the effort. This price will be paid for satisfactory contract performance. Award fee earned (if any) will be paid in addition to that fixed price. See 16.401(e) for the requirements relative to utilizing this contract type.

FAR 16.401(e) covers the general policy requirements for the use of award fee contracts as discussed previously in the general policy on award fee contracts. Similar to guidance on CPAF contracts, the FAR requires that FPAF contracts are only used if other incentive contracts, such as FPIF or FPFF, cannot be used. The next section provides a brief summary of the history of award fee contracts in federal procurement.

F. BRIEF HISTORY

The history of incentive contracting may trace back to the U.S. Army's procurement of the first flying machine. The Army used an incentive-type contract that motivated the Wright brothers to achieve two objective criteria in the development of the *Wright Flyer* in 1908 (Snyder, 2001). Incentive-type contracts, award fee contracts in particular, became more prominent in the 1960s. Tremaine (2008) noted that "the National Aeronautics and Space Administration (NASA) had been largely credited with successfully instituting formal incentive contracts since the early 1960s" (p. 223). Further, NASA established the first guidance on CPAF contracts in 1967 with its issuance of the *NASA Cost-Plus Award Fee Contracting Guide*, (NHB 5104.4; Nash, Cibinic, & Yukins, 2011). Award fee contracts grew in use throughout the 1960s and 1970s and flourished until recent GAO reports in 2005 and 2006 challenged their effectiveness in motivating contractor performance.

G. RECENT ISSUES IDENTIFIED BY THE GOVERNMENT ACCOUNTABILITY OFFICE AND THE DEPARTMENT OF DEFENSE INSPECTOR GENERAL

In 2004, the United States Senate Committee on Armed Services' Subcommittee on Readiness and Management Support asked the GAO to conduct an audit of DOD incentive and award fee contracts to "determine whether award fees and incentive fees have been used effectively as a management tool for achieving DOD's desired acquisition outcomes" (GAO, 2005, p. 2). The GAO has published numerous reports in response to this inquiry and multiple other inquiries on incentives and award fees. The key reports discussed in this section include: *DOD Has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcomes* (GAO-06-66); *DOD Wastes Billions of Dollars through Poorly Structured Incentives* (GAO-06-409T); *Guidance on Award Fees Has Led to Better Practices but Is Not Consistently Applied* (GAO-09-630); and *Application of OMB Guidance Can Improve Use of Award fee Contracts* (GAO-09-839T). This section discusses the conditions that precipitated the initial inquiry, the major findings and recommendation of each report, and then summarizes the agencies' initial responses to GAO recommendations.

The DOD Inspector General (IG) conducted an audit of CPAF contracts in 1995. The IG report concluded the following:

> Award fees contained adequate incentive amounts for contractors to reduce costs for the four contracts reviewed. Methods to determine and compute award fees were adequate. Contracting officers at Fort Eustis, Newport News, Virginia, agreed to reevaluate the type of contract for base operating services during the next acquisition cycle in response to concerns expressed during the audit. We did not identify any material management control weaknesses. In addition, the objectives that performance indicators were to achieve were being accomplished through the evaluation plans for the contracts' award fee determination on all four contracts reviewed. (DODIG, 1995, p. 1)

This report presented a favorable view of award fee contracts but perhaps hinted at potential issues with award fee structures and administration. The IG audit of award fee contract appropriateness identified concerns that "award fee Board scores were not always consistent with write-ups in the award criteria factor of performance" (DODIG,

1995, p. 4). The report noted that "seven out of nine statements listed under the award criteria factor of performance fit the description of average performance" (DODIG, 1995, p. 4). The IG assessed that the performance score given was 10–20 points higher than the annotated performance statements supported. Further, the IG concluded that these "inconsistencies showed a[n] overpayment … of … $608,275" (DODIG, 1995, p. 4). Another finding indicated that agencies failed to properly reevaluate contract type selection for follow-on contracts. Contract actions that were originally cost-reimbursement type contracts, but subsequently established adequate pricing histories through contract execution, were remaining CPAF contracts. These findings parallel the issues that led to the conditions for the congressional inquiries that prompted the GAO audits.

The issues identified in the IG report manifest the conditions that precipitated the congressional inquiry into the DOD's use of incentives and award fee contracts. Prior to the 2004 congressional inquiry, the GAO provided previous reports that showed "fundamental acquisition problems within the DOD, especially a lack of key product knowledge at critical junctures, have contributed to such issues as cost increases, schedule delays, and performance shortfalls in weapons programs" (GAO, 2005, p. 1). These issues resonated with top DOD and acquisition executives who "raised concerns about how effectively these [incentive and award] fees are being used because DOD programs have paid contractors large amounts of fee on acquisitions that are falling behind schedule, overrunning costs, and experiencing significant technical problems" (GAO, 2005, p. 2). Marquee programs that used award fee contracts, such as the Joint Strike Fighter tactical fighter aircraft, Comanche reconnaissance attack helicopter, and F/A-22 Raptor tactical fighter aircraft were either being canceled or facing significant schedule delays and cost overruns. This troubling state of DOD acquisitions prompted the congressional inquiry into DOD incentives and award fee contracts.

The GAO's first report on the DOD's use of award and incentive fees bluntly stated, in the title, that the "DOD has paid billions in awards and incentive fees regardless of acquisition outcomes" (GAO, 2005). In response to the inquiry, the GAO (2005) reviewed a sample of 93 award and incentive fee contracts, out of a population of 597

contracts, with a contract dollar value of $10 million or greater. Of those contracts, 52 had only award fee line items, 27 contracts had only incentive fee elements, and 14 contracts had both award and incentive fee provisions (GAO, 2005). The report identified the following issues in the DOD's use of award and incentive fees:

- Payment of award fee is not linked to acquisition outcomes such as cost, schedule, and performance;
- Contractors are afforded additional opportunities to receive unearned award fee, known as rollover fees;
- Large percentage of fees paid are for "acceptable, average, expected, good, or satisfactory" performance;
- Lessons learned and best practices are not shared at agency level; the DOD does not collect data on award fee use;
- DOD does not have a method to evaluate the performance of award fee contracts. (GAO, 2005)

The report findings were an indictment of the DOD's use of incentive and award fee contracts. The GAO contended that the DOD wasted billions of dollars by paying, on average, 90% of the award and incentive fee, despite not meeting cost or schedule targets in some instances and giving contractors second opportunities to earn unpaid incentive and award fees (GAO, 2005). In the sample, the GAO (2005) found that award fee payments ranged from a low of 36% to a high of 100% paid.

To address these findings, the GAO offered seven recommendations to the Under Secretary of Defense for Acquisitions, Technology, and Logistics (USD[AT&L]). The seven recommendations provided to the USD(AT&L) by the GAO (2005) to improve the link between incentive and outcomes are as follows:

1. Instructing the military services to move toward more outcome-based award fee criteria that are both achievable and promote accountability for acquisition outcomes;
2. Ensuring that award fee structures are motivating excellent contractor performance by only paying award fees for above satisfactory performance;

3. Requiring the appropriate approving officials to review new contracts to make sure these actions are being taken. DOD can improve its use of award[-]fees on all existing contracts by;

4. Issuing DOD guidance on when rollover is appropriate. In the longer term, DOD can improve its use of award and incentive fees by;

5. Developing a mechanism for capturing award- and incentive-fee data within existing data systems, such as the Defense Acquisition Management Information Retrieval system;

6. Developing performance measures to evaluate the effectiveness of award and incentive fees as a tool for improving contractor performance and achieving desired program outcomes;

7. Developing a mechanism to share proven incentive strategies for the acquisition of different types of products and services with contracting and program officials across DOD. (p. 5)

The DOD concurred with the GAO and agreed to implement policy changes to address Recommendations 1, 4, and 7. The DOD agreed to address these three recommendations in a follow-on policy memorandum. The DOD partially concurred with the remaining four recommendations. The DOD disagreed with the GAO's assessment of only paying award fees for above satisfactory performance and stated that "it was both fair and reasonable to pay a portion of the award fee for this level of performance, but agreed that the preponderance of fee should be paid for excellent performance and that it would reinforce existing policies in its March memorandum" (GAO, 2005, p. 5). The next GAO report provided further insight into the issues identified in GAO-06-66 through the statement of the Comptroller General of the United States to the Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate.

In GAO 06-409T, the Comptroller General of the United States asserts that the "DOD wastes billions of dollars through poorly structured incentives," as noted in the title of the report, and provides recommendations to address this problem (GAO, 2006). In this report, the GAO claimed that "DOD programs routinely engage in award fee practices that do not hold contractors accountable for achieving desired outcomes and undermine efforts to motivate contractor performance" (GAO, 2006, Highlights). The

GAO (2006) pointed to the same issues identified in GAO-06-66 (GAO, 2005) as the underlying causes of this claim, but highlighted the following practices as symptomatic:

- Evaluating contractors on award fee criteria that are not directly related to key acquisition outcomes (e.g., meeting cost and schedule goals and delivering desired capabilities to the warfighter);
- Paying contractors a significant portion of the available fee for what award fee plans describe as "acceptable, average, expected, good, or satisfactory" performance;
- Giving contractors at least a second opportunity to earn initially unearned or deferred fees. (GAO, 2006, Highlights)

This report reiterated the recommendations provided to the USD(AT&L) in GAO-06-66. Prior to the release of this report, the Office of the USD(AT&L; OUSD[AT&L]) released a policy memorandum to address Recommendations 1, 2, 4, and 7 in the GAO-06-66 report. In 2007, the Office of Management and Budget (OMB) issued a memorandum for chief acquisition officers and senior procurement executives that provided guidance on the use of incentives in contracts. These memorandums are discussed in a subsequent section. The next section covers a GAO report that assesses agencies' actions in response to the OMB policy memorandum.

The GAO generated report GAO-09-630, *Guidance on Award Fees Has Led to Better Practices but Is Not Consistently Applied*, in response to various requests from Congress. Congress members requested that the GAO determine "whether the new emphasis on award fees has improved DOD's and NASA's use of these fees and whether other agencies were implementing OMB's guidance" (GAO, 2009b, p. 2). The requests specifically asked the GAO to audit the following:

> (1) identify the actions agencies have taken to revise or develop policies and guidance to reflect OMB guidance on using award fees, (2) determine whether current practices for using award fee contracts are consistent with the new guidance, and (3) determine the extent that agencies are collecting and analyzing information on award fees to evaluate their use and sharing that information within their agencies. (GAO, 2009b, p. 2)

This section focuses only on the GAO assessment of the DOD's actions in implementing OMB's guidance.

The GAO found that the DOD revised or reemphasized policies to be generally consistent with OMB guidance. The report indicated that the DOD had issued guidance that stated "that award fees must be linked to desired outcomes, defines the level of performance used to evaluate contractors, and prohibits payment of award fees to contractors for unsatisfactory performance" (GAO, 2009b, p. 3). Additionally, the GAO identified that the DOD established a community of practice (CoP) through the Defense Acquisition University (DAU) to share lessons learned, best practices, and other information about incentives and award fee contracts with acquisition professionals. The GAO also reported favorably that the DOD established procedures to gather performance measurement data on incentive and award fee contracts.

Despite the DOD's positive policy changes, the GAO found that many acquisition professionals in the agencies were not familiar with the new DOD guidance or the OMB guidance. This failure to effectively promulgate new DOD policy likely accounts for the GAO's subsequent finding that many practices in the DOD, at the time, were still not in line with the OMB guidance. For example, despite providing guidance to limit the use of rollover award fees, the GAO found that "some programs continue[d] to roll over unearned award fees and award up to 84% of available award fees for satisfactory performance" (GAO, 2009b, pp. 3-4). The GAO concluded their report with the recommendation that the DOD continue to apply its guidance and work with other agencies to develop performance measurement methods and successful strategies.

The final GAO report discussed in this section, GAO-09-839T, *Application of OMB Guidance Can Improve Use of Award Fee Contracts,*" provided a summary of the GAO-09-630 report discussed above. This report encapsulated the statement of the Director of Acquisition and Sourcing Management. His statement alludes to the fact that the DOD was ahead of some agencies in implementing OMB guidance, likely due to their response to the previous audit by the GAO as reported in GAO-06-66 in 2005. The Director recommends that the five agencies involved in the report form an interagency working group to "identify how best to evaluate the effectiveness of award fees as a tool for improving contractor performance and achieving desired program outcomes and ... develop methods for sharing information on successful strategies" (GAO, 2009a, p. 8).

H. DOD, LEGISLATIVE, AND OMB RESPONSES TO GAO AUDITS

The DOD responded to the GAO audit reports through policy reviews, policy changes, establishing a community of practice, commissioning a research study, and issuing updates to the Defense Federal Acquisition Regulation Supplement (DFARS) Procedures, Guidance, and Information (PGI). The John Warner National Defense Authorization Act (NDAA) for Fiscal Year 2007 included guidance to link award and incentive fees to acquisition outcomes. OMB issued a memorandum with guidance on the appropriate use of incentive contracts (NDAA, 2006). These responses altered the use of award fee contracts. This section highlights policy changes and legislative requirements and discusses their impacts. This section is organized in chronological order and starts with the first memorandum issued by the USD(AT&L) in response to the GAO-06-66 report (GAO, 2005).

The USD(AT&L) issued guidance through a policy memorandum titled *Award Fee Contracts (FAR 16, DFARS 215, DFARS 216)* on March 29, 2006 (Finley, 2006). This memorandum was the initial response to the GAO-06-66 report and addressed Recommendations 1, 2, 4, and 7 contained within that report. The memorandum offered guidance that "it is imperative that award fees be tied to identifiable interim outcomes, discrete events or milestones, as much as possible" (Finley, 2006, p. 1). The practice of providing an award fee for less than satisfactory performance is forbidden, and guidance is provided to ensure award fees for satisfactory performance is considerably less than for excellent performance. The use of rollover fees is heavily discouraged and guidance is given to make its use the exception rather than the rule. Further guidance is given that requires Fee Determining Officials to document the rationale for the approval of rollover award fees in the contract file. The last recommendation from the GAO-06-66 report is addressed with the announcement of the establishment of "the 'Award and Incentive Fees' Community of Practice (CoP) under the leadership of the Defense Acquisition University (DAU)" (Finley, 2006, p. 2). The memorandum concluded with the notification that the DFARS and its PGI would be updated to reflect the guidance provided. The acquisition workforce execution of this policy resulted in the reduction in

the use of award and incentive fee contracts by 46% in 2007 and 85% in 2008 across the DOD (Rutherford, 2009).

The John Warner National Defense Authorization Act for Fiscal Year 2007 codified some of the GAO recommendations into law. This law required that the Secretary of Defense issue guidance on the appropriate use of award and incentive fees within 180 days of its enactment (NDAA, 2006). The law further required that the instructions in the guidance:

- Link fees to acquisition outcomes defined in terms of program cost, schedule, and performance;
- Establish appropriate authorization levels for the approval of award and incentive fee use;
- Define rating standards descriptions and associated percentage of award fee pool to be paid for the corresponding rating; establish the percentage of award fee pool available to be awarded for "satisfactory" performance;
- Ensure no award fee is paid for below satisfactory performance;
- Provide direction on the use of award fee rollover; ensure consistency in guidance and definitions for use of award and incentive fees amongst all DOD entities;
- Ensures that the DOD collects data on award and incentive fee use and evaluates the data on a regular basis;
- Includes a method to evaluate the effectiveness of award and incentive fee use in meeting program objectives by motivating contractor performance;
- Establish a method to share proven strategies (NDAA, 2006).

The law further directed that the Secretary of Defense implement a research study to assess possible independent research mechanisms and report the findings within one year after enactment.

The USD(AT&L) responded to the requirements in the John Warner National Defense Authorization Act for Fiscal Year 2007 by issuing a policy memorandum titled *Proper Use of Award fee Contracts and Award Fee Provisions* on April 24, 2007 (Assad, 2007). This memorandum provided guidance to utilize objective criteria to measure

contract performance when possible (Assad, 2007). In addition, guidance was provided that if objective criteria could not be developed and the use of a CPAF was still appropriate, the Head of the Contracting Activity (HCA) would have to sign a determination and finding (D&F; Assad, 2007). Further, tables with the award fee adjectival ratings, definitions, and corresponding award fee pool earning percentages were delivered for use in all future award fee contracts. Table 2 provides the ratings, percentages, and descriptions as listed in the memorandum and captured in the FAR. The memorandum concluded by noting that these policies were in effect as of August 1, 2007 and that they would be incorporated into the DFARS or DFARS-PGI.

In 2006, the DOD asked DAU to conduct a research study in response to the GAO-06-66 report (GAO, 2005). The purpose of the study was to "determine what generally afforded strong correlations between incentive-type contracts and expected performance outcomes" (Tremaine, 2008, p. 217). The goal of the report was to identify a proven technique in linking award fees to desirable outcomes effectively and share the results with the acquisition community. The research consisted of a review of the GAO-06-66 report, follow-up discussions with the GAO, interviews with 25 weapon system acquisition program representatives, and analysis of program practices with program effectiveness. The research found a correlation between the contractor's meeting desirable outcome objectives and certain practices as outlined in the following summary of findings:

- Strongly Communicated Expectations and Feedback: Frequent and unambiguous communication/feedback made a noticeable difference for incentive contracts.

- Key measures can validate whether or not a program achieved certain necessary intermediate milestones along a program's critical glide path.

- The incorporation of base fee in award fee contracts made a noticeable difference.

- Trained and Experienced Personnel made a noticeable difference for incentive contracts. (Tremaine, 2008, pp. 228–233)

The research study recommended revising workforce training to incorporate the findings in the study into mandatory acquisition workforce training curricula and provide positive examples of these practices on the DAU CoP.

I. OTHER RESEARCH ON AWARD FEES

Award fees and their use has been the subject of research for the past few decades. Schade (1990) conducted research on the use of FPAF contracts using economic, motivational, and contracting theory. Schade used surveys provided to government and private industry representatives to determine the most effective use of FPAF contracts. His findings concluded that FPAF contracts provided the advantages of better communication between the government and private industry while enhancing the industrial base through larger profits that may in turn be invested in research and development for future governmental business (Schade, 1990). Schade (1990) also found that FPAF contracts required added government administration requirements and may be subject to contractors gaming proposals by providing minimum performance standards in anticipation of being able to show improvement to earn the award fee. His ultimate conclusion was that FPAF contracts can motivate contractor performance when applied properly.

Hearns and Mitchell (2007) surveyed the acquisition workforce to determine their response to GAO's reports on poorly structured award and incentive fees in the DOD. They surveyed contract managers at the National Contract Management Association (NCMA) 45th Annual Aerospace and Defense Contract Management Conference to gather feedback on the GAO reports. Their findings determined that about half of the acquisition workforce respondents agreed with the GAO findings that the DOD use of award fees does not motivate contractors to achieve acquisition outcomes, that a significant portion of the award fees were given for satisfactory performance, and that DOD uses rollover of fees (Hearns & Mitchell, 2007). Additional findings indicated that DOD required "improvement in the areas of training, administration, and implementation of award and incentive fees" (Hearns & Mitchell, 2007, p. 2). They offered that contract managers should form a partnership between the government and contractors to facilitate

communication and open communication in order to share risk and ensure cost and schedule objectives (Hearns & Mitchell, 2007).

The last research included in this literature review was conducted by Ricks, Roberston, and Jolliffe (2013). Ricks, et al. used an acquisition workforce survey and literature review to identify alternative methods to award fee contracts or best practices in the current use of award fee contracts. Their findings concluded that the success of award fee contracts depended on the following resource factors: funding, technology, leadership, and agency or military service culture (Ricks, et al., 2013). They identified adequate workforce training as the most critical factor to award fee contract success (Ricks, et al., 2013). Their recommendations for improving the effectiveness of the use of award fee contracts included development of agency standard operating procedures with detailed evaluation criteria development, better guidance on contract award fee administration, and improved workforce training (Ricks et al., 2013).

J. SUMMARY

This chapter provided a summary of award fee literature, prior research, and government policies and assessments. The first section discussed the purpose and goals of award fee contracts as an incentive mechanism to motivate contractor performance. The next section explained how award fee contracting relates to the key functions in the six phases of the contracting process. The following section summarized the government policies on award fee contracting. A brief history of award fee use in government was provided in section E. Section F discussed recent issues with award fee use in DOD contracting as identified by the GAO and DODIG. The next section provided a summary of the DOD, legislative, and OMB response to GAO audits. The last section provided a summary of other research conducted on award fee contracting.

When properly structured, administered, and executed, award fees incentivize contractors towards cooperative behavior that achieves specified acquisition objectives in complex contracts. In order to achieve this behavior, award fee criteria must be well defined and linked to the desired outcomes, must be objectively measured in a manner understood by both parties, and must have award fee amounts that are commensurate

with the contractor's motivations to achieve the desired outcomes. DOD, legislative, and OMB reforms have aligned award fee policies to assist in achieving the specificity required to structure award fees to achieve their intended purpose. The next chapter includes a discussion of the methodology used in this research to determine whether the DOD's use of award fees, specifically the award fee decisions, relate to contract success.

III. METHODOLOGY

A. INTRODUCTION

This chapter discusses the methodology used to conduct this study. Research was conducted in three phases: planning, data collection, and data analysis. The approach was modeled after Naegle's, *Analysis Planning Methodology: For Thesis, Joint Applied Projects, & Master of Business Administration (MBA) Research Reports* (Naegle, 2014).

The planning phase began after the research topic was identified. The first step of planning was developing research questions that would guide the data collection plan. The questions were constructed to extract the information necessary to answer the research topic. The research questions are discussed in Chapter I, Section C of this report. The next step of the planning phase was developing a research matrix (Naegle, 2014). For this research a data source matrix (DSM) spreadsheet was created using Microsoft Excel. The spreadsheet included columns for each data element to be filled in while examining contract files. Many of the Excel cells have pre-established drop-down boxes to simplify and standardize data entry. The appendix is provided to illustrate a completed section of the DSM. Utilizing the pre-established cells in the spreadsheet identifies potential data availability issues, provides a data collection rehearsal, helps to recognize missing data elements, and flushes out poorly constructed research questions.

The next phase is the data collection phase. The researchers selected a command from the Navy to collect the data. This command executes large dollar value, major defense system programs for the Navy. Thirteen contracts that contained at least one award fee contract line item number (CLIN) were selected from a total sample pool of 31 contracts. The contracts needed to have EVM data reporting requirements and contractor performance rating submissions to provide measures of contract success.

Only contracts that were awarded during or after FY2008 were selected. FY2008 marks when the majority of DOD policy changes regarding award fees were implemented. Contracts awarded prior to FY2008 were likely following obsolete guidance. Another stipulation is the contract has to have been awarded prior to February

2014. This provides sufficient time for the contractor to have received a performance rating submission, multiple EVM data collection points, and at least one award fee decision to have occurred. All three of these criteria need to be recorded to achieve a complete a data set. A contract awarded within the last year will be missing one or possibly all of these key components.

Once all the data was captured on the DSM, the last phase was data analysis. Using the data gathered, correlation and correlation models were run using Microsoft Excel and data analysis functions. This process allows multiple arrays of data to be selected and compared to each other. The output is the correlation coefficient, a number that falls between negative one and one (Bluman, 1995). The closer the number is to negative one or one, the stronger the correlation is between the two fields. Negative one represents a negative correlation, where the two fields have an inverse relationship. As one field increases in value, the other field will equally decrease. Likewise, a correlation coefficient of one represents a relationship where as one field increases, the other field equally increases. Fields with a correlation coefficient close to zero either have a weak or no relationship (Bluman, 1995). Analyzing correlation can only be accomplished between fields with numerical values. The following sections discuss the data fields, where the information originated and how they were analyzed.

B. DEVELOPMENT OF THE DATA SOURCE MATRIX (DSM)

1. ACQUISITION LIFE CYCLE

This section illustrates how the acquisition life-cycle phase was determined and the linkage to award fee contracts. The acquisition life cycle is the process through which a product evolves from infancy to disposal. There are five phases of the acquisition life cycle that were discussed in Chapter II, Section D.2. Acquisition Category (ACAT) 1 programs are required to submit a Selected Acquisition Report (SAR) on an annual basis (Cochrane & Brown, 2010). Some ACAT 1 programs may require greater visibility and submit SARs quarterly. SARs provide cost, schedule, and performance information about a program to include the current acquisition life-cycle phase. All ACAT 1 programs are considered major defense acquisition programs (MDAPs); however, some MDAPs are

not ACAT 1 programs and therefore do not require SAR submission. In most cases, the acquisition life-cycle phase will be obtained from the program SAR. In cases where the program does not submit SARs, the contract will be analyzed to make that determination. The specific contract language will suggest the acquisition life-cycle phase of the program. This information was analyzed to see the acquisition phase where award fee use is more prevalent. It was expected that earlier life-cycle phases would be more conducive to using award fee contracts.

2. CONTRACT ELEMENTS

This section explains the contract document and what contract elements can be extracted to analyze award fees. The contract document was used to obtain several data elements; these include: the type of contract used, the contract deliverable, the source selection criteria used to choose the best offer, a breakdown of each individual contract line item number (CLIN), and the total dollar value of the contract. Government contracts follow a standardized format called the Uniform Contract Format (UCF). All of the previously mentioned elements can be found in "the schedule," Sections A–H, Part I, with the exception of source selection criteria, which is found in Section M, Part IV, "evaluation factors for award" (FAR 15.204). The type of contract was annotated as either cost-reimbursement or fixed-price. The contract deliverable also had two options, either service or material. The source selection criteria were summarized as lowest price technically acceptable (LPTA), trade off, or sole source. Section M of each contract was analyzed to determine the source selection method utilized. The number of award fee CLINs was determined by reviewing each CLIN and counting CLINs with award fee provisions. The total dollar value of the contract was located in Section B, Part I of the contracts and documented in the DSM. These contract elements can be found in every award fee contract.

3. AWARD FEE PLAN

This section discusses the award fee plan (AFP), award fee board, award fee criteria, and fee determining official's (FDO) role in the award fee process. AFPs contain the following data elements essential to the research: award fee pool dollars available,

award fee percentage paid, award fee payment criteria, and an explanatory statement describing payment or non-payment of award fees. Award fees are determined using a review board structure. The AFP identifies members of an award fee board. The award fee board periodically meets to assess contractor performance against criteria established in the AFP. Based on the board's analysis, they submit a recommendation on how much award fee a contractor should earn to the FDO. The FDO will consider the award fee board's recommendation and ultimately decide on the amount of award fee to be paid to the contractor (FAR 16.001). In this study, the award fee board recommendations and FDO decisions were recorded as the dollar amount paid to the contractor. That dollar amount will be divided by the total available award fee pool to calculate the percentage of available award fee pool paid. This calculation was annotated as the award fee percentage paid.

4. EARNED VALUE MANAGEMENT

This section discusses how earned value management (EVM) information was used to study award fee relationships to contract success. EVM is a programmatic tool based on commercial industry, American National Standards Institute/Electronic Industries Alliance Standard 748 (ANSI/EIA-748) guidelines (Cochrane & Brown, 2010). EVM "integrates all contract work scope, cost and schedule objectives in a single performance baseline" (Rendon & Snider, 2008, p. 233). DOD utilizes EVM to track and forecast program progress. EVM data is archived in the Defense Acquisition Management Information Retrieval (DAMIR) system and maintained by program offices on major defense programs (ACAT 1). EVM data is also available on fee determining official (FDO) documents in some cases. Four EVM metrics would prove valuable to this study: cost variance percent (CV%), schedule variance percent (SV%), cost performance index (CPI), and schedule performance index (SPI). CV% and CPI measure whether a program is operating under budget or over budget. SV% and SPI measure a program with regard to schedule overrun or underrun. The data was listed as the exact numerical value provided on either the FDO document or in DAMIR.

CPI and SPI can be categorized by using the rating scale provided in FAR 16.401 for contractor performance. To compare CPI and SPI with the FAR adjectival ratings, Figure 1, the Sherman Lipscomb EVM Performance Matrix (SLEPM) was developed by the researchers based on award fee plan criteria of an MDAP. This tool allows conversion of numerical values obtained in FDO documents and DAMIR to adjectival ratings. The values associated with each adjectival rating are not approved in acquisition policy, but were determined based on a reasonable expectation of a program's cost and schedule outcome.

CPI / SPI		Excellent	Very Good	Good	Satisfactory	Unsatisfactory
		0.97	0.94	0.91	0.88	0.85
Excellent	0.97	0.9409	0.9118	0.8827	0.8536	0.8245
Very Good	0.94	0.9118	0.8836	0.8554	0.8272	0.799
Good	0.91	0.8827	0.8554	0.8281	0.8008	0.7735
Satisfactory	0.88	0.8536	0.8272	0.8008	0.7744	0.748
Unsatisfactory	0.85	0.8245	0.799	0.7735	0.748	0.7225

Figure 1. Sherman Lipscomb EVM Performance Matrix (SLEPM)

5. CONTRACTOR PERFORMANCE RATING

This section focuses on the contractor performance rating process, the system interface to extract data, and how performance rating information was used in this study. Contractor performance ratings are an important means to measure a contractor and play

an essential role in selecting winning offers of future contracts. According to FAR 42.1500, Contractor Performance Information, "the fee amount paid to contractors should be reflective of the contractor's performance and the past performance evaluation should closely parallel and be consistent with the fee determinations." Contractor performance is required to be annotated after each contract period of performance and during contract closeout.

Contracting officers submit contractor evaluations into an online repository called Contractor Performance Assessment Reporting System (CPARS). CPARS contains a second module, called Federal Awardee Performance and Integrity Information System (FAPIIS). According to the PPIRS website, FAPIIS was developed to fulfill the Duncan Hunter National Defense Authorization Act requirement to track the "integrity and performance of covered Federal agency contractors and grantees (General Services Administration [GSA], 2014)." FAPIIS contains information about contract terminations and receives suspension/disbarment information from the Excluded Parties List System (EPLS). CPARS feeds the information from CPARS and FAPIIS to another database titled Past Performance Information Retrieval System (PPIRS). In July 2002, the DOD endorsed PPIRS as the single, authorized application to retrieve contractor performance information (GSA, 2014).

The FAR requires the following information be recorded regarding a contractor's performance:

1. Conforming to contract requirements and to standards of good workmanship;
2. Forecasting and controlling costs;
3. Adherence to schedules, including the administrative aspects of performance;
4. Reasonable and cooperative behavior and commitment to customer satisfaction;
5. Reporting into databases (see subpart 4.14 and reporting requirements in the solicitation provisions and clauses referenced in 9.104-7);
6. Integrity and business ethics;
7. Business-like concern for the interest of the customer. (FAR 42.1501)

For this study, contractor performance rating information was extracted from PPIRS for each contract in the research sample. Contractors receive ratings in six

categories on a 1-to-5 point evaluation scale. The six categories are quality, schedule, cost control, business relations, management of key personnel, and utilization of small business. The 1-to-5 point evaluation scale is measured with 5 being "exceptional," 4 equating to "very good," 3 equaling "satisfactory," 2 being "marginal," and 1 representing "unsatisfactory" performance. In some cases, the category can be marked as "NA," if that measure was not applicable to contractor performance.

Wilhite, Stover, and Hart (2013) established a model to determine contract success using the same grading criteria. They analyzed 715 contracts to correlate contract success with contractor performance assessment ratings. In their study, receiving an evaluation score of marginal or unsatisfactory in any one of the six categories labeled the entire contract as a failure. Those contracts not determined to be failures were labeled as successful (Wilhite et al., 2013). The results are displayed by contract type in Table 3 below. Wilhite, Stover, and Hart observed a 5.17% contract failure rate out of a sample of 55 award fee contracts. Of those contracts, failing contractor performance assessment ratings were recorded in cost control, business relations, and management of key personnel. Wilhite, Stover, and Hart's contract success and failure model will be utilized to determine contract success and failure in this study.

Table 3. Contract Type Total Successes and Failures

Contract Type Categories	**Total Successes**	**Total Failures**	**Total Contracts**	**Failure Rate**
CPAF	55	3	58	5.17%
Combination	2	2	4	50%
CPFF	34	2	36	5.56%
CPIF	4	0	4	0%
FFP	510	14	524	2.67%
Other	88	1	89	1.12%
Total	**693**	**22**	**715**	**3.08%**

C. METHOD OF STATISTICAL ANALYSIS

Descriptive statistics and pairwise correlation were used to analyze the data in this research. The statistical analysis required comparison of one variable to several other variables to determine relationships. A univariate approach was utilized for descriptive statistics analysis. For correlation analysis, pairwise deletion was used. Pairwise deletion is an effective statistical approach when random pieces of information are missing from a data set (Cohen, Cohen, West & Aiken, 2013). To conduct pairwise correlation, a missing-data correlation matrix is created that allows sets of data with missing information to be omitted from analysis. A limitation of using this method is that it creates some "awkwardness" in the inference and confidence limits caused by varying observation sizes (Cohen et al., 2013, p 434). Pairwise correlation was used to analyze the relationship between award fee percent paid and contractor performance ratings. Further analysis of the data was conducted to determine the relationship between the acquisition life-cycle phase, the award fee criteria, and the weighted percent of each award fee criteria. The amount of award fee paid in comparison to the expected amount of award fee paid based on contractor performance ratings was also examined. The data analysis findings are further discussed in Chapter 4, Sections B and C.

D. SUMMARY

This chapter discussed the methodology used in the conduct of this research. The first section introduced Naegle's three-phase approach and how it served as a foundation for the study. The second section described the development of the DSM by detailing the five major data groups of acquisition life-cycle, contract elements, award fee plan, earned value management, and contractor performance rating. The last section covered the statistical analyses used to understand the data. The next chapter provides the research findings, data analyses, study implications, and answers to the research questions.

IV. ANALYSIS AND FINDINGS

A. INTRODUCTION

This chapter provides the results of the research into the relationship between award fee decisions and contract success. The chapter begins with presentation of the basic research findings and points out limitations discovered during data collection, to include unavailability of EVM data. The chapter goes on to offer more in-depth analysis of the data. This section discusses actual award fee decisions in comparison to expected award fee decisions based on contractor performance ratings, analysis of award fee decisions to the acquisition life-cycle phase, and presents the relationship of contract success with contractor performance ratings using pairwise correlation. The third section discusses implications of the research findings. The last section provides answers to the research questions.

B. DATA SUMMARY

This section introduces the basic findings of the research. A sample of 13 contracts was randomly chosen from a population of 31 award fee contracts from a major Navy command. Out of the 13 contracts chosen, seven contracts contained enough information to be considered a complete data set. All findings and analysis are based on the seven contracts that comprised a complete data set. The seven contracts were all multiyear contracts with periods of performance occurring between 2007 to 2014. All seven contracts had been closed out at the time of review. The average total contract value was $62 million, including base year cost and all option years. The average award fee pool was $5.2 million, with an average award fee decision percentage of 82% that equates to a $4.5 million award fee payment average. All of the contracts included statements prohibiting award fee pool rollover as recommended by GAO 06-66. The predominant contract type was CPAF with six observations. There was one CPFF contract that contained one award fee CLIN. Each of the seven contracts used trade off as the method to select the winning bidder for the contract. The FDO was the Program Executive Officer (PEO) on five contracts, with the Program Manager (PM) performing

FDO duties on two contracts. Two contracts were in the technology development (TD) acquisition life-cycle phase, with four contracts in engineering and manufacturing development (EMD), and one contract in the operations and support (O&S) phase. Five contracts were subcomponents of ACAT I programs, with one contract being a subcomponent of an ACAT II program. Table 4 below presents the award fee data just discussed.

Table 4. Contract Award Fee Data

Observation #	Acquisition Life-cycle Phase	Award Fee Pool	Award Fee Paid	Award Fee Decision %
1	TD	$6.7M	$5.6M	83.22%
2	TD	$19.65M	$16.6M	84.55%
3	EMD	$419K	$365K	87.00%
4	EMD	$155K	$123K	79.15%
5	EMD	$886K	$714K	80.59%
6	EMD	$294K	$208K	70.82%
7	O&S	$8.6M	$7.8M	90.27%

1. Limitation Discovered During Data Collection

A significant limitation was discovered during data collection. EVM data was a proxy measure that the study intended to use as a predictor of contract success; however, relevant EVM data to the contract samples was not available. As previously mentioned five contracts were for subcomponents of an ACAT I program. The overarching ACAT I program had EVM data available, but it could not be verified or applied at the subcomponent level. The degree to which the subcomponent cost, schedule and performance measures contributed to the overarching ACAT I program cost, schedule and performance outcomes could not be determined, resulting in EVM being omitted from our analyses.

2. Observations during Data Collection

Several observations were discovered during data collection. There were three observations of consequence noted during data collection. The first observation was

differences in contract file structure; contract files did not follow a standardized format. Most contract files had documentation checklists; however, some did not. Some contract files contained request for proposal and pre-solicitation documentation, where other contract files excluded those documents, as they are not required to be retained.

The second observation that related to contract file standardization is the absence of award fee decision documentation in the contract file. The researchers were expecting to find FDO decisions and related contract modification documents included in the physical contract files. They were found in one contract file, but were not available in the other twelve contract files selected. However, for six of those twelve contracts FDO decisions were located in the electronic contract database. Availability of FDO decisions or award fee decision contract modifications constrained the study to using seven data points instead of thirteen.

The final observation pertained to contractor performance rating submissions. The researchers expected to find contractor performance ratings at the conclusion of each performance period, as well as a contract closeout performance rating submission. On several contracts, the researchers could not locate contractor performance rating submissions following each period of contract performance; however, every contract did have a contract closeout performance rating submission. For uniformity and cohesiveness of analysis, the contract closeout contractor performance ratings were used and the few period of performance contractor performance ratings were omitted. The next section provides further analysis of the research data.

C. ANALYSIS

This section presents analyses of the research data collected. The three analyses are: 1) evaluation of actual award fee payments and expected award fee payments compared to acquisition life-cycle phase, 2) examining award fee payments and contractor performance ratings to measure contract success, and 3) pairwise correlation to determine the relationship between award fee decisions and contract success.

The first analysis compared actual award fee payments versus expected award fee payments. The actual award fee payment and expected award fee payment data points

were then plotted according to when they occurred in the acquisition life-cycle to determine the existence of any trends. Actual award fee payment amounts were provided in the contract files. To calculate expected award fee amounts, the weighting of each award fee plan criterion was multiplied by the contractor performance rating score for each category. The weighted scores were then summed. The sum of the weighted scores represents the expected award fee decision, if award fee decisions, award fee criteria weighting, and contractor performance ratings were perfectly aligned. For example, if a contractor received perfect contractor performance ratings of 5 (Excellent) in all categories, the expected award fee decision is 100%. The results of this analysis are shown below in Figure 2.[1] All contract actual and expected award fee payments varied, with the closest match being a 1% difference (actual 79%, expected 80%). Although there was only one close match, the average difference between actual and expected award fee payments was 3%. No trend was discernable when comparing actual award fee payments and expected award fee payments to the acquisition life-cycle phase. More data is required to analyze award fee decision trends in relationship to the acquisition life-cycle.

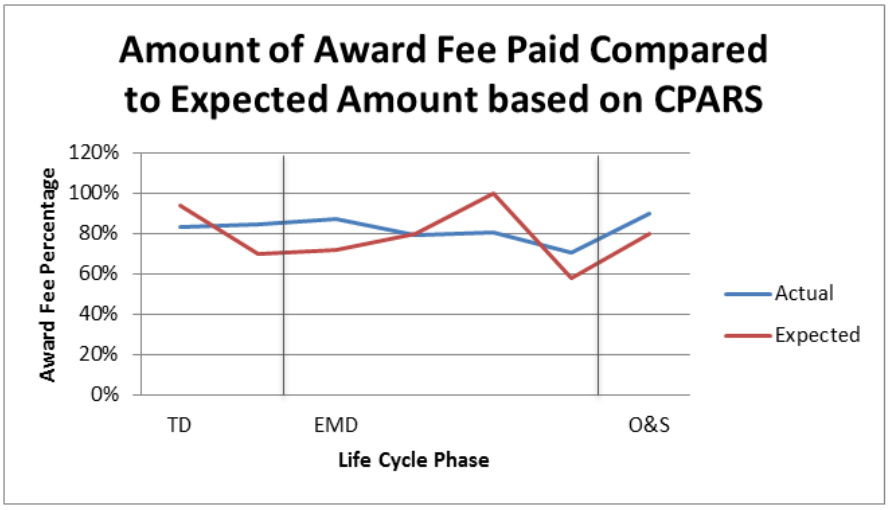

Figure 2. Award Fee Actual versus Expected Amount

[1] The graph represents a snap shot of the seven contract observations in different phases of the acquisition life-cycle. The graph does not reflect single contract observations as they proceed along the acquisition life-cycle.

The second analysis technique examined award fee payments and contractor performance ratings to measure contract success. The Wilhite, Stover, and Hart contract success and failure model discussed in Chapter III, Section B.5 provided the basis to determine contract success and failure.[2] Out of the seven contracts, only one score of marginal was observed. The score of marginal was entered in the contractor performance rating schedule category. This contract was awarded for a product in the EMD acquisition life-cycle phase. By receiving a contractor performance rating of marginal, this contract was deemed a failure per the Wilhite, Stover, and Hart model. The contract failure rate is 14%, with one failure occurring in the sample of seven contracts. Wilhite, Stover, and Hart observed a failure rate of 5.17% for CPAF contracts. The higher failure rate in this study is likely the result of a smaller sample size with only seven contracts analyzed compared to 55 contracts in Wilhite, Stover, and Hart's study. Mathematically, the smaller sample size will result in a higher failure rate with only one failed contract (1/7 = 14%). The contract that included the marginal contract performance rating resulted in the lowest award fee decision at 71%, which is 11% less than the average award fee decision. Figure 3 reflects the award fee payment percentage, average contractor performance rating, and contract success or failure. The data is arranged from highest award fee percent paid to lowest percent paid from left to right.

[2] Earned value management was omitted as a surrogate measure of contract success due to unavailability of relevant data.

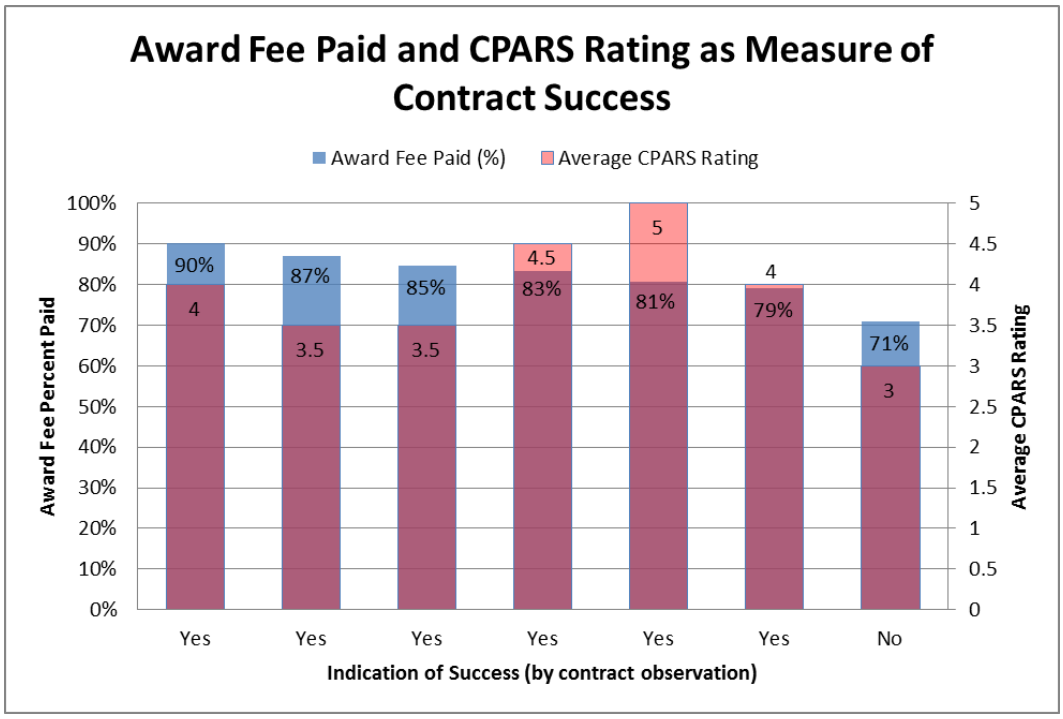

Figure 3. Award Fee and CPARS Rating to Measure Contract Success

Figure 3 shows positive and negative overlaps between award fee payments and average contractor performance ratings. Figure 4 below highlights the over or under delta of this comparison. The combined result is an average award fee overpayment of 4%. To determine the average CPARS percentage, the average CPARS rating was divided by the maximum possible CPARS score of 5. Average CPARS percentage was then subtracted from the percentage of award fee paid to determine the delta. A positive delta indicates an overpayment, where a negative delta indicates an underpayment.

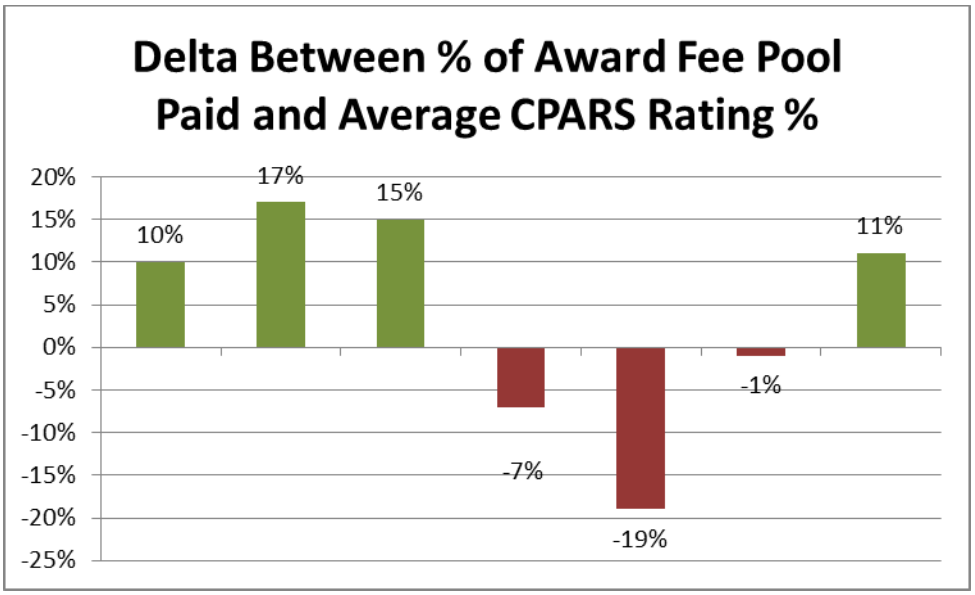

Figure 4. Delta between Award Fee Paid and Average CPARS Rating

The last data analysis method used pairwise correlation to determine the relationship between award fee decisions and contract success. Table 5 depicts the pairwise correlation results. Column (A), highlighted in yellow, shows the correlation relationships between earned award fee and the various CPARS evaluation factors. The results show a positive correlation between award fee decisions and contractor performance ratings. The only exception to positive correlation is program management with a score of -.295; all other correlations are positive. The production contractor performance rating had the strongest correlation with award fee decisions at .589. Cost control had the next highest correlation at .414. Although positive correlation can be shown, none of the findings are statistically significant.[3] The lack of statistical significance is likely reflective of the small sample size. A larger sample of award fee contracts is needed to determine the true nature of these relationships. The next section discusses implications of the research findings and analysis.

[3] Values marked with an asterisk in Table 5 had statistical significance, but were not further analyzed due to lack of standardization in the contract samples. Each contract had different weighting of the contractor performance categories.

	Award Fee Earned (A)	Technical (B)	Production (C)	Schedule (D)	Cost Control (E)	Program Management (F)
Award Fee Earned	1.000					
# observations	7					
Technical	0.108	1.000				
# observations	7	12				
Production	0.589	0.538	1.000			
# observations	6	9	9			
Schedule	0.384	0.904*	0.667	1.000		
# observations	7	11	8	11		
Cost Control	0.414	0.692*	0.811*	0.700*	1.000	
# observations	7	12	9	11	12	
Program Management	-0.295	0.692*	0.229	0.735*	0.294	1.000
# observations	7	12	9	11	12	12
* Statistically Significant (p < .05)						

Table 5. Pairwise Correlation Table

D. IMPLICATIONS

This section discusses the implications of the research findings. The implications of this research are: 1) DOD's responsiveness to GAO Report 06-66, 2) award fee alignment with contractor performance ratings, and 3) contract data capturing.

1. DOD's Response to GAO Report 06-66

This research indicates that DOD sufficiently responded to GAO Report 06-66 recommendations. GAO recommended eliminating the usage of award fee rollover. In all 31 contracts observed, every contract contained verbiage prohibiting the use of award fee rollover. Under this change, contractors will have one opportunity period to earn the available award fee pool. In report 06-66, GAO suggested DOD was liberally determining award fee decision amounts. GAO observed an average award fee payment percentage of 90%, with several large-scale programs receiving 100% award fee payments. This research observed an 82% award fee payment percent, with zero

observations of 100% award fee decisions. Likewise, the poorest performing contractor per contractor performance rating received the lowest award fee payment percentage at 70.82%.

2. Award Fee Alignment

Although the findings were not statistically significant, the researchers believe award fee decisions were aligned with contractor performance ratings. Firstly, there was a positive correlation between award fee decisions and contractor performance ratings. Using the Wilhite, Stover, and Hart contract success and failure model, six out of seven award fee contracts were shown to be successful. Additionally, two comparative measures showed actual and expected award fee payments were 3% different on average and average award fee overpayment was only 4%.

3. Contract Data Capturing

Contracting research is complicated by a lack of standardized, sufficient data. Multiple hard copy files, electronic files, and contract databases are utilized during the contracting process. Through the conduct of this research it was noted that the contents of those files are not standardized. This makes collecting contracting data for the purposes of comparative analysis problematic. Critical programmatic measures, such as EVM data is not readily available for all decision makers. In some instances contractor performance ratings did not align with the contractor performance rating narratives. For instance, a contractor received low performance ratings, but the narrative only contained praise. These issues raise questions regarding the utility of the current manual and electronic contract files.

The next section provides answers to the research questions that guided this study.

E. RESEARCH QUESTION ANSWERS

This section provides answers to the three research questions aimed at determining the relationship between award fee decisions and contract success.

1. How are Award Fee Decisions and EVM Related?

This question was unable to be answered due to lack of availability of applicable EVM data. As discussed in the findings section of this Chapter, EVM data was only available for five contracts at the overarching program level. The researchers could not directly link the subcomponent contracts that they reviewed to the EVM data available. For this reason, EVM data was omitted from the study and this research question remains unanswered.

2. How are Award Fee Decisions and Contractor Performance Related?

This question can be best answered using pairwise correlation data provided in Table 5 in Section C of this Chapter. As the pairwise correlations indicate, there is a positive correlation between award fee decisions and contractor performance ratings. None of the relationships are statistically significant; however, that is likely the result of a small sample size. The limited data suggests that award fee payments are aligned with contractor performance ratings. There was only one contract failure identified in the sample using the Wilhite, Stover, and Hart contract failure and success model. That contract received the lowest award fee payment percentage of 71%, which is 11% less than the average award fee payment percent. Furthermore, as discussed in Chapter IV, section C, the average difference between actual and expected award fee payments was only 3%.

Contracts that received a contractor performance rating average above 4.0 displayed greater volatility in the award fee payment percentage. As shown in Figure 3, the contracts that received the highest award fee payments had an average contractor performance rating of 3.67, resulting in an average overpayment of 10.67%. Further research is needed to determine the cause of this variability.

3. How are Successful Contracts, as Identified by EVM and Contractor Performance Ratings, Related to Other Contract Elements?

Six out of seven contracts were deemed successful according to contractor performance ratings. Of those contracts, several contract elements were consistent. In particular, each successful contract was multiyear, used a tradeoff source selection

strategy, was predominantly a CPAF contract, and had an average total dollar value of $70.67 million. It could be argued that these results suggest that award fee contracts can be used in multiple scenarios, throughout the acquisition life-cycle with success. The large total contract dollar value indicates award fees can successfully support major procurement programs. Award fees increase administration costs due to the need for increased performance monitoring and requirements associated with the award fee decision process. The association of award fees and large total dollar value contracts highlights the government's desire to improve contracting performance outcomes by utilizing contractor incentives. The added cost of utilizing award fees appears to be beneficial on such large-scale projects.

F. SUMMARY

This chapter provides the results of the study into the relationship between award fee decisions and contract success. The chapter began by covering the basic findings of the research. It went on discuss further analysis of the data by using three different data comparison techniques. The next section highlighted the implications of this research as it relates to the DOD. The last section provided answers to the three research questions. The next chapter summarizes the study, submits final conclusions, and offers areas for further research.

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V. SUMMARY, CONCLUSION, AND AREAS FOR FURTHER RESEARCH

A. SUMMARY

The DOD spends roughly half of its annual budget on contracts or purchase orders, highlighting the importance of motivating contractor performance (GAO, 2014). Incentive contracts, such as award fee contracts, are key mechanisms contracting officers and program managers can use to incentivize contractors to achieve desired outcomes in areas such as cost, schedule, and performance. Incentive contracts have been used by the DOD as early as the beginning of the 20th century with the Army's requisition of the W*right Flyer* (Snyder, 2001). The use of award fee contracts became more prevalent in the 1960s and grew from the 1970s until 2006 with the release of GAO 06-66.

Award fee contract usage dropped by 46% in 2007 and 85% in 2008 in response GAO's report (Rutherford, 2009). Research in response to GAO's report focused on the problems with award fees, including misalignment of incentives with desired outcomes, inadequate workforce training, lack of standard operating procedures, and poor guidance (Hearns & Mitchell, 2007; Ricks, et al., 2013; Tremaine, 2008). Tremaine's research, geared at identifying "correlations between incentive-type contracts and performance outcomes," prompted our research questions, hence we posited that EVM and CPARS data may be used as surrogate indicators of contract success or failure, which could then be examined in relation to award fee decisions (Tremaine, 2008, p. 217).

B. CONCLUSION

The purpose of this research was to determine if a relationship exists between award fee decisions and contract success or failure as measured by earned value management (EVM) or contractor performance ratings. To determine if a relationship existed, we attempted to answer the following questions.

1. How are Award Fee Decisions and EVM Related?

This question was not answered due to the unavailability of suitable data to determine any relationship. The EVM data collected was for MDAP level reporting and could not be parsed out for the smaller contract actions related to the program. Due to the inability to directly link the EVM data to the contract action, this research question could not be answered.

2. How are Award Fee Decisions and Contractor Performance Related?

We found a positive correlation between award fee decisions and contractor performance ratings. The strength of this finding is not statistically significant, likely due to a small sample size. Contract actions with a rating of exceptional in CPARS tended to correlate with a commensurate amount of award fee payment. Similarly, the contract action with a rating of satisfactory in CPARS received a commensurate amount of award fee decision paid. This indicates that, for the contract actions we observed, DOD is paying award fees that are in line with the level of performance achieved.

3. How are Successful Contracts, as Identified by EVM and Contractor Performance Ratings, Related to Other Contract Elements?

Each of the six successful contracts observed had several similar contract elements: multiyear contracts, tradeoff source selection strategies, CPAF contract types, and an average total dollar value of $70.67 million. Similar to our second research question, this finding is more descriptive in nature due to the small sample size. No clear inferences could be made of the relationship of successful contracts by life-cycle phase. The only unsuccessful contract observed occurred during the EMD phase. For this contract, the award fee decision matched the CPARS ratings.

C. AREAS FOR FURTHER RESEARCH

We recommend the following actions for further research: increase the size of the data pool within the Navy and other DOD services and agencies, conduct a comparative analysis of the pre- and post-DOD policy changes in response to the GAO 06-66 report, conduct further analysis of contract elements, and determine the plausibility of using

EVM as a surrogate measure for contract success on MDAPs. The next few sections provide more details of each of these recommendations.

1. Increase the Size of the Data Pool

The strength of this research would be enhanced with the inclusion of other Navy SYSCOMs. The expansion of the data pool to include multiple SYSCOMs would allow for a larger sample size, varied standard operating procedures (SOPs) from each SYSYCOM, and a more comprehensive assessment of the use of award fees across the Navy. The larger sample size would increase the statistical rigor, allow for more complex analysis (such as regression), and enable a more granular assessment of the relationship of award fee decisions to contract success using CPARS and EVM as surrogate measures.

The inclusion of other DOD services or agencies, such as the U.S. Army, U.S. Air Force, or other agencies such as the Missile Defense Agency, would allow for a more comprehensive assessment of the relationship of award fee decisions and contract success as measured by CPARS and EVM across the entire DOD. The inclusion of these other services or agencies would allow for a much larger sample size, increase statistical rigor, allow for more complex analysis (such as regression), and enable a more granular assessment of the relationship of award fee decisions to contract success using CPARS and EVM as surrogate measures. The resultant findings would be more representative of the DOD and potentially allow for the identification of trends, best practices, and shared lessons learned.

2. Conduct a Comparative Analysis of the Pre- and Post-DOD Policy Changes in Response to the GAO 06-66 Report

Emulating the research methodology used in this research on data for award fee decisions prior to the DOD response to GAO 06-66 would enable a comparison of the relationship of award fee decisions and contract success using CPARS and EVM as surrogate measures. This approach may require the development of another surrogate measure of success for data captured prior to the implementation of mandatory CPARS reporting. The examination of the data for award fee decisions prior to GAO 06-66, or

perhaps in the same timeframe as the period reviewed by GAO, may help determine if the GAO report focused too heavily on newsworthy failures to derive their findings.

3. Further Analysis of Contract Elements

Further research on the relationship of award fee decisions and contract success using CPARS and EVM as surrogate measures with a focus on the analysis of the relationship by contract element would allow for the identification of variables that may influence contract success or a positive relationship correlation. A larger sample size tailored towards the inclusion of representative sample sizes by contract element would allow for the identification of the contract elements' impact on the relationship of award fee decisions to contract success using CPARS and EVM as surrogate measures.

4. Determining the Plausibility of Using EVM as a Surrogate Measure for Contract Success on MDAPs

Further research structured around only MDAP contracts would allow the determination of the efficacy of using EVM as a surrogate measure for contract success. Close coordination with PEOs may facilitate the access to requisite data to test the Sherman Lipscomb EVM Performance Matrix (SLEPM). Additionally, further research could be to determine the most effective method for using EVM as a surrogate measure for contract success. This research requires a comprehensive case study approach for the assessment of MDAPs' use of award fees within their programs and comparison with EVM reporting by award fee periods of performance. This level of detail is not available in the Defense Acquisition Management Information Retrieval (DAMIR) system and would require close coordination with the PEO and access to granular EVM data. The results of this research may lead to the development of a new use for EVM as not only a risk management and reporting tool, but also a contract management tool.

APPENDIX. DATA SOURCE MATRIX (DSM)

Observation #	NAICS	PSC	Predominant Contract Type	Consolidated Requirement	Multiyear	Period Start	Period End	Dollar Value	Trade Off or LPTA	ACAT/SCAT Level	FAR Part	Life Cycle Stage	Joint Urgent Operational Need (JUON)	# CLINs	FDO	Award Fee Criterion #1
1	336611	1903	Cost Plus Award Fee	No	Yes	12/7/07	12/5/12	$62,430,600	Trade Off	ID	FAR 15	Production & Deployment	No	69	PM	Schedule
2	336611	1924	Cost Plus Award Fee	Yes	Yes	3/11/09	3/12/14	$288,159,874	Trade Off		FAR 15	Operations & Support	No	18	PM	Management
3	336611	J998	Cost Plus Award Fee	Yes	Yes	10/22/09	10/22/14	$91,585,410	Trade Off		FAR 15	Operations & Support	No	38	PM	Management
4	336611	J998	Cost Plus Incentive Fee	Yes	Yes	7/12/10	7/12/15	$75,715,304	Trade Off		FAR 15	Production & Deployment	No	30	PM	Management
6	336611	J019	Cost Plus Award Fee	Yes	Yes	1/14/10	1/13/15	$65,840,435	Trade Off		FAR 15	Operations & Support	No	59	PM	Management
7	336611	J999	Cost Plus Award Fee	No	Yes	8/25/08	8/24/14	$98,849,071	Trade Off		FAR 15	Operations & Support	No	18	PM	Management
8	541712	5841	Cost Plus Award Fee	No	Yes	12/12/07	9/18/09	$8,516,463	Trade Off	IAC	FAR 15	Engineering & Manufacturi	No	14	PEO	Management

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LIST OF REFERENCES

Assad, S. D. (2007). *Proper use of award fee contracts and award fee provisions.* (Policy Memorandum). Washington, DC: Undersecretary of Defense for Acquisition, Technology, and Logistics. doi:April 24, 2007

Bluman, A. G. (1995). *Elementary statistics*. WCB McGraw-Hill. Retrieved from http://deltacollege.edu/emp/ckim/Labs_PDF/Least_Squares-Bluman.pdf

Bower, D., Ashby, G., Gerald, K., & Smyk, W. (2002, January). Incentive mechanisms for project success. *Journal of Management in Engineering*, 37-43.

Brown, T. L., Potoski, M., & Van Slyke, D. M. (2013). *Complex contracting: Government purchasing in the wake of the U.S. Coast Guard's Deepwater program.* Cambridge, UK: Cambridge University Press.

Cochrane, C., & Brown, B. (2010). *Integrated defense acquisition, technology, and logistics life cycle management system*. Defense Acquisition University (DAU). Retrieved from https://dap.dau.mil

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). Applied multiple correlation/correlation analysis for the behavioral sciences. New York, NY. Routledge.

Department of Defense Inspector General (DODIG). (1995). *Audit of cost-plus-award fee contracts.* (No. 96-019). Arlington, VA: Inspector General, Department of Defense. doi:October 31, 1995

Defense Federal Acquisition Regulation Supplement (DFARS), 48 C.F.R. Ch. 2 (2012). Retrieved from http://farsite.hill.af.mil/vfdfara.htm

Defense Federal Acquisition Regulation Supplement, Procedures, Guidance & Information (DFARS-PGI). Retrieved from http://farsite.hill.af.mil/vfdfara.htm

Defense Federal Acquisition Regulation, Subcontractor Kickbacks, 48 C.F.R. 3.502-1 (2014). Retrieved from http://www.acquisition., gov/far/current/pdf/FAR.pdf

Finley, J. I. (2006). *Award fee contracts (FAR 16, DFARS 215, DFARS 216).* (Policy Memorandum). Washington, DC: Under Secretary of Defense for Acquisition, Technology and Logistics. doi:March 29, 2006

Garrett, Gregory A. (2010). *World class contracting.* Chicago, IL. CCH Publishing.

General Services Administration (GSA). (2014). Past Performance Information Retrieval System (PPIRS). Retrieved from https://www.ppirs.gov/

Government Accountability Office (GAO). (2005, December). *Defense acquisitions: DOD has paid billions in award and incentive fees regardless of acquisistion outcomes* (GAO-06-66). Washington, DC: Author.

Government Accountability Office (GAO). (2006). *Defense acquisitions: DOD wastes billions of dollars through poorly structured incentives.* (No. GAO-06-409T). Washington, DC: Government Accountability Office.

Government Accountability Office (GAO). (2009a). *Federal contracting: Application of OMB guidance can improve use of award fee contracts.* (No. GAO-09-839T). Washington, DC: Government Accountability Office.

Government Accountability Office (GAO). (2009b). *Federal contracting: Guidance on award fees has led to better practices but is not consistently applied.* (No. GAO-09-630). Washington, DC: Government Accountability Office.

Government Accountability Office (GAO). (2014, December). *Defense contracting: Early attention on the contracting process needed to enhance competition* (GAO-14-395). Washington, DC: Author.

Hearns, Q. M., & Mitchell, D. (2007). *Analysis of acquisition workforce responses to recent GAO reports on award and incentive fees*. Monterey, CA: Naval Postgraduate School.

May, P. (2007). *Schwarzenegger salutes rapid repair of MacArthur Maze*. San Jose Mercury News. May 26 (accessed April 19, 2015). Retrieved from www.mercurynews.com/_ci_5994233.

Naegle, B. (2014). *Analysis planning methodology: For thesis, joint applied projects, & MBA research reports.* Monterey, CA: Naval Postgraduate School.

Nash Jr., R. C., Cibinic Jr., J., & Yukins, C. R. (2011). *Formation of government contracts* (4th ed.). Wolters Kluwer Law & Business.

National Defense Authorization Act (NDAA) for fiscal year 2007, H.R. 5122, 109th Congress. (2006). doi:October 17

Nelson, Erik. (2007). *MacArthur Maze contract awarded*. San Jose Mercury News. May 8 (accessed April 19, 2015). Retrieved from http://origin.mercurynews.com/news/

Rendon, Rene. (2011). *Assessment of Army contracting Command's contract management processes (TACOM and RDECOM)*. Monterey, CA: Naval Postgraduate School.

Rendon, R. & Snider, F. (2008). *Management of defense acquisition projects*. American Institute of Aeronautics and Astronautics. Reston, VA.

Ricks, S. Robertson, T., & Jolliffee, D. (2013). *Problems with award fee contracts in the Department of Defense*. Monterey, CA: Naval Postgraduate School.

Roe, M. J. (2001). The shareholder wealth maximization norm and industrial organization. *University of Pennsylvania Law Review*. Vol. 149, No. 6, pp. 2063-2081

Rutherford, E. (2009). Pentagon sees "sea change" in use of award fee contracts. *Defense Daily News*. Retrieved from http://www.defensedaily.com/pentagon-sees-sea-change-in-use-of-award fee-contracts

Schade, Don. (1990). *Fixed-price-award fee: an economic motivational, and contracting theory analysis*. Monterey, CA: Naval Postgraduate School.

Snyder, T. J. (2001). Analysis of air force contract implementation. *Air Force Journal of Logistics, 25*(2), 14-21.

Tremaine, R. L. (2008). Incentive contracts: The attributes that matter most in driving favorable outcomes. *Defense Acquisition Review Journal, 15*(3), 216-238.

Wilhite, T., Stover, A., & Hart, J. (2013). *Management levers that drive services contracting success*. (Master's thesis). Monterey, CA: Naval Postgraduate School.

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