



May 2020

COST-TYPE CONTRACTS

Procedures Needed for Sharing Information on Contract Choice among Military Departments

Accessible Version

GAO Highlights

Highlights of [GAO-20-352](#), a report to the Ranking Member of the Committee on the Budget, U.S. Senate

Why GAO Did This Study

When acquiring major weapon systems, DOD can choose between several different contract types. One of these is cost-type, under which DOD pays allowable costs incurred by the contractor. Historically, DOD has struggled to manage its major acquisition programs. The result has been billions in cost growth and schedule delays in providing systems to the warfighter.

GAO was asked to review DOD's use of cost-type contracts for its major acquisition programs. This report addresses the use of and range of cost and schedule outcomes for cost-type contracts for major weapon system acquisitions, and how military departments share information about contract choice.

GAO analyzed government contracting data on obligations by contract type for fiscal years 2011 through 2019 on contracts in DOD's portfolio of major acquisition programs. GAO compared contract types for 21 major acquisition programs with their cost and schedule outcomes; reviewed seven recently awarded cost-type contracts for major acquisition programs, selected to reflect the different military departments and appropriation types; and interviewed contracting officials.

What GAO Recommends

GAO recommends that DOD establish procedures requiring the military departments to collect and share findings from their reviews of contracting approaches, such as by updating the existing online compendium. DOD agreed with GAO's recommendation.

View [GAO-20-352](#). For more information, contact Shelby S. Oakley at (202) 512-4841 or oakleys@gao.gov.

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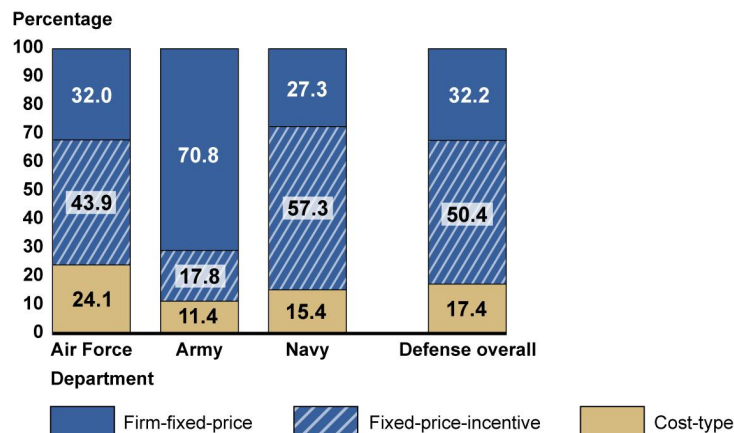
What GAO Found

To acquire new major weapon systems, such as aircraft, ships, and satellites, the Department of Defense (DOD) uses a variety of contract types including cost-type contracts, under which the government assumes more risk. DOD is required to document its risk assessment in choosing contract types for major programs. Risks assessed can include use of new technologies and stability of system costs and requirements. Once awarded, cost-type contracts have additional reporting requirements to help monitoring of cost and schedule performance.

GAO analyzed program cost and schedule outcomes for 21 major acquisition programs, and did not find a clear relationship between these outcomes and contract types used. However, programs that completed certain knowledge-based acquisition practices generally had better cost and schedule outcomes than programs that did not implement those practices. These practices include completing preliminary design review before the start of system development and releasing at least 90 percent of design drawings by critical design review.

From fiscal years 2011 through 2019, DOD used cost-type contracts for a small proportion—under one-fifth on average—of obligations for its major acquisition programs. This proportion varied across the military departments (see figure).

Proportion of Obligations by Contract Type for Major Defense Acquisition Programs from Fiscal Years 2011 through 2019



Source: GAO analysis of Federal Procurement Data System-Next Generation data. | GAO-20-352

A change to DOD's peer review process for its largest contract awards reduced a means for sharing best practices and lessons learned about contract choice across the military departments. In 2019, the Office of the Secretary of Defense announced the end of its peer reviews for most competitive procurements above \$1 billion. While these contracts will instead be reviewed through the military departments' own processes, DOD currently does not require the departments to collect and share their findings. DOD has an online compendium of peer review findings; however, this was last updated in 2013. Using an existing centralized resource such as the compendium could help contracting officials learn from the experiences of peers across DOD by exposing them to good practices for structuring contracts.

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Abbreviations

AMRAAM	Advanced Medium Range Air-to-Air Missile
CIRCM	Common Infrared Countermeasure
CVN 78	CVN 78 Gerald R. Ford Class Nuclear Aircraft Carrier
DAMIR	Defense Acquisition Management Information Retrieval
DCMA	Defense Contract Management Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DOD	Department of Defense
DPC	Defense Pricing and Contracting
EVM	earned value management
F-15 EPAWSS	F-15 Eagle Passive Active Warning Survivability System
FAR	Federal Acquisition Regulation
FPDS-NG	Federal Procurement Data System-Next Generation
G/ATOR	Ground/Air Task Oriented Radar
HMS	Handheld, Manpack, and Small Form Fit Radios
JPALS	Joint Precision Approach and Landing System
MDAP	Major Defense Acquisition Program
NDAA	National Defense Authorization Act
SUPSHIP	Supervisor of Shipbuilding, Conversion and Repair
U.S.C.	United States Code
USD(A&S)	Under Secretary of Defense for Acquisition and Sustainment

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May 19, 2020

The Honorable Bernard Sanders
Ranking Member
Committee on the Budget
United States Senate

Dear Senator Sanders:

The Department of Defense (DOD) has historically provided its new major weapon systems—including aircraft, ground vehicles, missiles, ships, and satellites—to the warfighter through its major defense acquisition programs (MDAP).¹ DOD expects its current portfolio of 85 MDAPs to cost \$1.8 trillion in total. Despite some improvements in recent years, DOD has historically struggled to meet cost and schedule expectations for its MDAPs. This has resulted in billions of dollars of cost growth and delays in providing systems to the warfighter. As a result, weapon systems acquisition has been on GAO's High Risk List since 1990. DOD typically contracts with private-sector companies in order to acquire these systems, using a variety of contract types. These include cost-type contracts that shift risk onto the government and away from the contractor, particularly for complex weapon systems development work that may lack precise specifications and accurate cost estimates.²

You asked us to review DOD's use of cost-type contracts for MDAPs. This report addresses: (1) the extent to which DOD uses cost-type contracts for MDAPs; (2) how DOD chooses among cost-type and other contract types for MDAPs and monitors their cost and schedule performance; (3) the range of cost and schedule outcomes across MDAPs that used cost-type contracts; and (4) the extent to which DOD

¹Major defense acquisition programs are those identified by DOD or that have a dollar value for all increments estimated to require eventual total expenditure for research, development, test, and evaluation of more than \$480 million, or for procurement of more than \$2.79 billion, in fiscal year 2014 constant dollars, but excluding rapid fielding and rapid prototyping acquisitions and defense business systems.

²Cost-type contracts are also referred to as cost-reimbursement contracts. For the purposes of this report, all such contracts are referred to as cost-type contracts.

shares information about choosing MDAP contract types across the military departments.

To assess the extent to which DOD uses cost-type contracts for MDAPs, we analyzed Federal Procurement Data System-Next Generation (FPDS-NG) data regarding obligations by contract type from fiscal year 2011 through fiscal year 2019 on contracts for programs in DOD's MDAP portfolio awarded from fiscal year 2010 through fiscal year 2018.³ We assessed data reliability by comparing the contract types identified in FPDS-NG for each contract with information on contract types contained in two DOD databases—Defense Acquisition Management Information Retrieval (DAMIR), and Earned Value Management-Central Repository—and determined the data were sufficiently reliable for the purposes of analyzing the extent of DOD's use of cost-type contracts for MDAPs.

To assess how DOD chooses among cost-type and other contract types for MDAPs and monitors their cost and schedule performance, we analyzed documentation and interviewed officials regarding contract choice and monitoring from DOD, military departments, and selected contracting commands. As illustrative examples of contract choice and monitoring under a variety of conditions, including different military departments and appropriation types, we also selected a nongeneralizable sample of seven MDAP contracts. Specifically, we selected for each of the three military departments the most recently awarded cost-type MDAP Research Development, Test, and Evaluation contract and the most recently awarded cost-type MDAP Procurement contract as reported in the December 2017 Selected Acquisition Reports. We also selected the most recently awarded cost-type MDAP contract for the Marine Corps. We interviewed contracting officials and reviewed key documentation such as acquisition strategies relating to each one of these contracts. We also reviewed our past work related to contract types

³The basic types of contracts described by the Federal Acquisition Regulation (FAR) may be used in combination with both fixed-price-type and cost-type contract line item numbers, unless otherwise prohibited. Per the Defense Federal Acquisition Regulation Supplement (DFARS) Procedures, Guidance, and Information, when entering contract type information into FPDS-NG, the data entrant is to choose the contract type that is applicable to the predominant amount of the contract action, based on the value of the line items.

used for MDAPs, including DOD's use of incentive contracts and the Navy's use of fixed-price-incentive contracts for shipbuilding.⁴

To assess the range of cost and schedule outcomes across MDAPs that used cost-type contracts, we identified the 21 non-shipbuilding MDAPs in DOD's current portfolio that as of January 2019 had completed system development, held a critical design review, and started production. We then compared the unit cost and schedule changes between each program's first full estimate and our most recent in-depth assessment of the program as of May 2019 with the types of contracts each program used.

Finally, to assess the extent to which DOD shares information about choosing MDAP contract types across the military departments, we reviewed DOD and military department documentation related to contracting review processes. We compared this information to DOD memorandums establishing practices and policies for sharing of acquisition information across DOD. We also interviewed officials from offices including Defense Pricing and Contracting (DPC) within the Office of the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)), and the cognizant Deputy Assistant Secretaries of the military departments. See appendix I for more information on our objectives, scope, and methodology.

We conducted this performance audit from February 2019 to May 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁴GAO, *Defense Contracting: DOD Needs Better Information on Incentive Outcomes*, [GAO-17-291](#) (Washington, D.C.: July 11, 2017); and *Navy Shipbuilding: Need to Document Rationale for the Use of Fixed-Price Incentive Contracts and Study Effectiveness of Added Incentives*, [GAO-17-211](#) (Washington, D.C.: Mar. 1, 2017).

Background

Contract Types Described by the Federal Acquisition Regulation

The government can choose from a wide selection of contract types to acquire the variety and volume of supplies and services agencies require to meet their needs. Contract types vary according to the degree and timing of the responsibility assumed by the contractor for the costs of performance, and the amount and nature of the profit incentive offered to the contractor for achieving or exceeding specified standards or goals.

The primary contract types described by the Federal Acquisition Regulation (FAR) fall into two broad categories—cost-type and fixed-price-type—and table 1 summarizes key features of each.

Table 1: Key Features of Cost-Type and Fixed-Price-Type Contracts

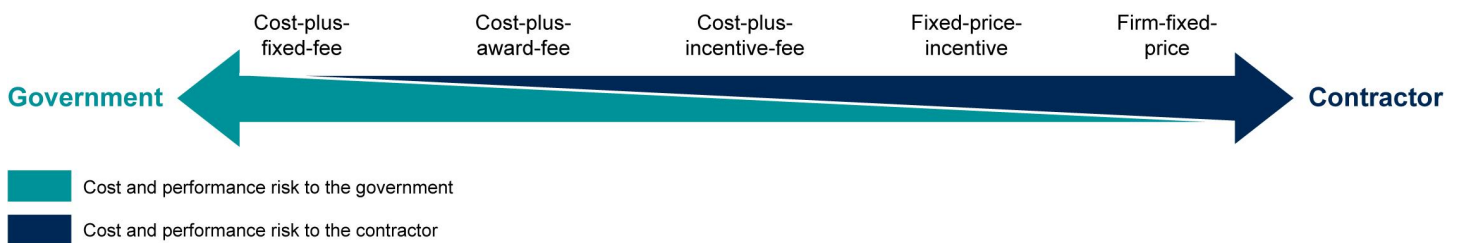
Feature	Cost-type	Fixed-price-type
Payment and incentive arrangements	<ul style="list-style-type: none">• Government pays allowable costs incurred by contractor, to the extent prescribed by the contract, such as certain compensation costs for work performed.• Incentive arrangements included in the contract can allow the contractor to earn fees tied to performance, such as for performing at lower costs.	<ul style="list-style-type: none">• Government pays a fixed price.• Incentive arrangements included in the contract can allow government to share in cost savings and can also allow the contractor to earn fees tied to performance.
Risk assumption	<ul style="list-style-type: none">• Government generally assumes the risk of a cost overrun.	<ul style="list-style-type: none">• Contractor generally assumes the risk of a cost overrun.
Expectations of contractor	<ul style="list-style-type: none">• Contractor is to make a good-faith effort to meet contract requirements within the estimated cost; however, government is not promised a completed item or service within that cost.	<ul style="list-style-type: none">• Contractor must meet contract requirements, including specified schedules, at firm prices or, in some cases, an adjustable price.

Source: GAO analysis of Federal Acquisition Regulation and Department of Defense data. | GAO-20-352

As illustrated in figure 1, within these categories the specific contract types range from cost-plus-fixed-fee, in which the contractor has minimal responsibility for the performance costs and the negotiated fee (profit) is fixed, to firm-fixed-price, in which the contractor has full responsibility for the performance costs and resulting profit (or loss). In between are the various incentive contracts, under which the contractor’s responsibility for the performance costs and the profit or fee incentives offered are tailored to the uncertainties involved in contract performance. For contracts with incentive fees or profits, the amount of fee or profit payable is related to

the contractor's performance, and generally involves an objective evaluation by the government of the contractor's performance toward cost, schedule, or technical goals. Award fees, on the other hand, typically emphasize multiple aspects of contractor performance that are more subjectively assessed, such as the contractor's responsiveness, technical ingenuity, or cost management. Furthermore, the basic types of contracts may be used in combination, with both fixed-price-type and cost-type contract line item numbers, unless otherwise prohibited. For example, a firm-fixed-price contract may have a cost-type line item for travel.⁵

Figure 1: Spectrum of Contract Types and Risk



Source: Defense Acquisition University. | GAO-20-352

The FAR states that selecting the contract type is generally a matter for negotiation and requires the exercise of sound judgment by the contracting officer. Negotiating the contract type and negotiating prices are closely related and should be considered together. The objective is for the government to negotiate a contract type and price (or estimated cost and fee) that will result in reasonable contractor risk and provide the contractor with the greatest incentive for efficient and economical performance.⁶ As also noted in the FAR, the government usually assumes greater risk in its contracts for more complex requirements, particularly those unique to the government. This is especially true for complex research and development contracts, where performance uncertainties or the likelihood of changes make it difficult to estimate performance costs in advance.⁷ Cost-type contracts are suitable for

⁵Two additional contract types available to the government are time-and-materials and labor-hour contracts. These both have a fixed labor rate, but include only an estimated number of hours to complete a task. Neither requires completion of the task within the agreed to maximum price, and both types pay the contractor for actual hours worked.

⁶FAR § 16.103(a).

⁷FAR § 16.104(d).

instances when uncertainties about contract performance do not allow accurate enough cost estimates to use a fixed-price-type contract—in other words, when programs choose to accept more risk. The level of risk drives the contract type chosen, with the contract then reflecting the risk of the work.

DOD programs may use different contract types across the life of the MDAP. For example, DOD guidance notes that the preferred contract type for development efforts is cost-type, and requires particular consideration of fixed-price-incentive contracts for acquisitions moving from development to production. Consistent with the FAR, DOD guidance also notes that firm-fixed-price production contracts may be in the government's best interest once costs have become stable.

DOD and Congress have encouraged use of fixed-price-type contracts where appropriate. For example, DOD's Better Buying Power initiative, which started in 2010, called for increased use of fixed-price-incentive contracts for programs transitioning from development to production. In addition, the National Defense Authorization Act (NDAA) for Fiscal Year 2017 required DOD to establish a preference for fixed-price-type contracts in the determination of contract type and specified approval requirements for use of cost-type contracts above certain dollar thresholds.⁸ Congress has also limited DOD's ability to use cost-type contracts to acquire production units absent congressional notification.⁹ Our prior work contains many recommendations related to incentive-type contracts. For example, in March 2017 we recommended that the Navy remind contracting officials to follow guidance on documenting the rationale for using fixed-price-incentive contracts, and in April 2017, the Navy issued a memorandum addressing this issue. In July 2017 we recommended that DOD collect and analyze data to determine the extent to which incentive contracts achieved desired outcomes. While DOD agreed with the recommendation and developed a template for the military departments to use to collect relevant information, it is still

⁸National Defense Authorization Act for Fiscal Year 2017, Pub. L. No. 114-328, § 829 (2016).

⁹National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, § 811 (2013).

gathering updates from the military departments about the status of this effort.¹⁰

Contracting for Major Defense Acquisition Programs

DOD acquires MDAPs through the Defense Acquisition System, which implements an adaptive acquisition framework that allows DOD officials to develop acquisition strategies and employ acquisition processes that match the characteristics of the capability being acquired.¹¹ The pathway for acquiring major capabilities generally includes four phases, three of which we focus on in this report: (1) technology maturation and risk reduction; (2) engineering and manufacturing development; and (3) production and deployment.¹² Programs typically complete a series of milestone reviews and other key decision points that authorize entry into a new acquisition phase, as illustrated in figure 2.

Figure 2: Key Milestones Associated with the Defense Acquisition System



Source: GAO analysis of Department of Defense data. | GAO-20-352

These milestones also typically mark critical contract award decisions. For example, the Milestone B decision commits the resources, including authorizing award of the program's development contract, needed to conduct development leading to production. Milestone C represents the decision to move forward with initial production, including award of the

¹⁰[GAO-17-211](#) and [GAO-17-291](#).

¹¹Department of Defense Directive No. 5000.01, *The Defense Acquisition System* (May 12, 2003, Incorporating change 2, Aug. 31, 2018); Department of Defense Instruction No. 5000.02, *Operation of the Adaptive Acquisition Framework* (Jan. 23, 2020); Department of Defense Instruction No. 5000.02T, *Operation of the Defense Acquisition System* (Jan. 7, 2015, Incorporating change 6, Jan. 23, 2020).

¹²In this report, we refer to the second and third phases more simply as system development and production.

initial production contract.¹³ A number of officials and agencies are involved in DOD's choice and monitoring of MDAP contracts.

Milestone decision authority: The designated individual with overall responsibility for the program who, at the time of key milestone reviews, approves the acquisition strategy with specified contract types. In approving the acquisition strategy, this individual must ensure that the strategy considers how to manage risk and how the contract type selected relates to the level of program risk in each acquisition phase. This individual is to use the acquisition strategy to assess the viability of the proposed approach, ensuring that it clearly explains how it is to be implemented with available resources, and is tailored to address program requirements and constraints.

Milestone decision authority for most MDAPs now resides with the military departments following a reform enacted in the NDAA for Fiscal Year 2016.¹⁴ Prior to this reform going into effect, a position within the Office of the Secretary of Defense typically served as the milestone decision authority for MDAPs until they entered the production and deployment phase.¹⁵ Following a reorganization of the Office of the Secretary of Defense enacted in the NDAA for Fiscal Year 2017, the USD(A&S) now serves as milestone decision authority for a small number of MDAPs, such as the F-35 program.¹⁶ For other MDAPs, the following officials serve as milestone decision authority within the military departments:

- the Assistant Secretary of the Air Force (Acquisition, Technology, and Logistics);
- the Assistant Secretary of the Army (Acquisition, Logistics, and Technology); and

¹³Milestone A represents the investment decision to pursue specific product or design concepts, and to commit the resources required to mature technology and reduce any risks that must be mitigated before subsequent resource commitment decisions. Prior to Milestone A is a solution development phase, which begins with the decision that a new product is needed and that activities to analyze alternative solutions will occur.

¹⁴National Defense Authorization Act for Fiscal Year 2016, Pub. L. No. 114-92, § 825 (2015), codified as 10 United States Code (U.S.C.) § 2430.

¹⁵Previously, this position—the Under Secretary of Defense for Acquisition, Technology, and Logistics—was milestone decision authority for about half of MDAPs. Since then, authority for 90 percent of MDAPs has been delegated to the military departments.

¹⁶National Defense Authorization Act for Fiscal Year 2017, Pub. L. No. 114-328, § 901(a) and (b) (2016), codified as 10 U.S.C. §§ 133a and 133b.

-
- the Assistant Secretary of the Navy (Research, Development, and Acquisition).¹⁷

Program manager: The designated individual with responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet user operational needs. The program manager plans acquisition programs, prepares programs for key decisions, and executes approved acquisition and product support strategies.

Contracting officer: The individual with the authority to enter into, administer, or terminate contracts and make related determinations and findings. Contracting officers are responsible for ensuring performance of all necessary actions for effective contracting, ensuring compliance with the terms of the contract, and safeguarding the interests of the United States in its contractual relationships. In order to perform these responsibilities, contracting officers are allowed wide latitude to exercise business judgement.

Defense Contract Management Agency (DCMA): The entity that provides contract administration services for most DOD buying activities. Its contract management offices work with defense contractors to help ensure they deliver goods and services that meet performance requirements on time and at projected cost.

Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP): The entity that is the Navy's on-site technical, contractual, and business authority for the construction of Navy ships. SUPSHIPS are co-located with the nation's major shipbuilders and oversee the construction of every Navy ship, from patrol craft to the Navy's most complex surface combatants and nuclear submarines and aircraft carriers.

In addition to serving as milestone decision authority for certain MDAPs, USD(A&S) is responsible for improving outcomes by gathering and distributing best practices and lessons learned across the military departments. One such mechanism related to contract type choice, established in 2008, was mandatory preaward peer review—conducted by DPC, an office within USD(A&S)—for solicitations and contracts valued at over \$1 billion and noncompetitive procurements over \$500

¹⁷National Defense Authorization Act for Fiscal Year 2016, Pub. L. No. 114-92, § 825 (2015), codified as 10 U.S.C. § 2430.

million.¹⁸ For these competitive procurements, DPC conducted phased peer reviews prior to three events—issuance of the solicitation, issuance of the request for final proposal revisions, and contract award. The peer review teams—composed of senior DOD contracting leaders and officials from other military departments, and whenever possible comprising the same personnel across the three phases—discussed contract type and structure, and reviewed key program documentation such as acquisition strategies. Upon completion of a review, the team provided its findings and recommendations to the contracting officer, among other officials. However, in August 2019, DPC announced that it would no longer conduct peer reviews for most competitive procurements above \$1 billion. Further details of this change are discussed later in this report.

While the individual military departments have distinct requirements for the weapon systems they acquire, they also on occasion procure similar types of platforms, and use the same relatively small pool of contractors. For example, the Air Force and Navy both purchase fighter aircraft, and all three military departments buy missile systems. In 2019, we analyzed the 183 major development and procurement contract awards for MDAPs reported by DOD at that time, and found that almost half went to five corporations and entities connected with them, constituting 72 percent of the dollars associated with those contracts.¹⁹

Small Proportion of Obligations for Major DOD Acquisitions Since 2011 Was on Cost-Type Contracts and Level Varied across Military Departments

From fiscal year 2011 through fiscal year 2019, a small proportion—an average of less than one-fifth—of obligations for programs in DOD’s portfolio of MDAPs was on cost-type contracts, although this proportion

¹⁸Peer reviews for procurements below these thresholds were to be performed by the military departments.

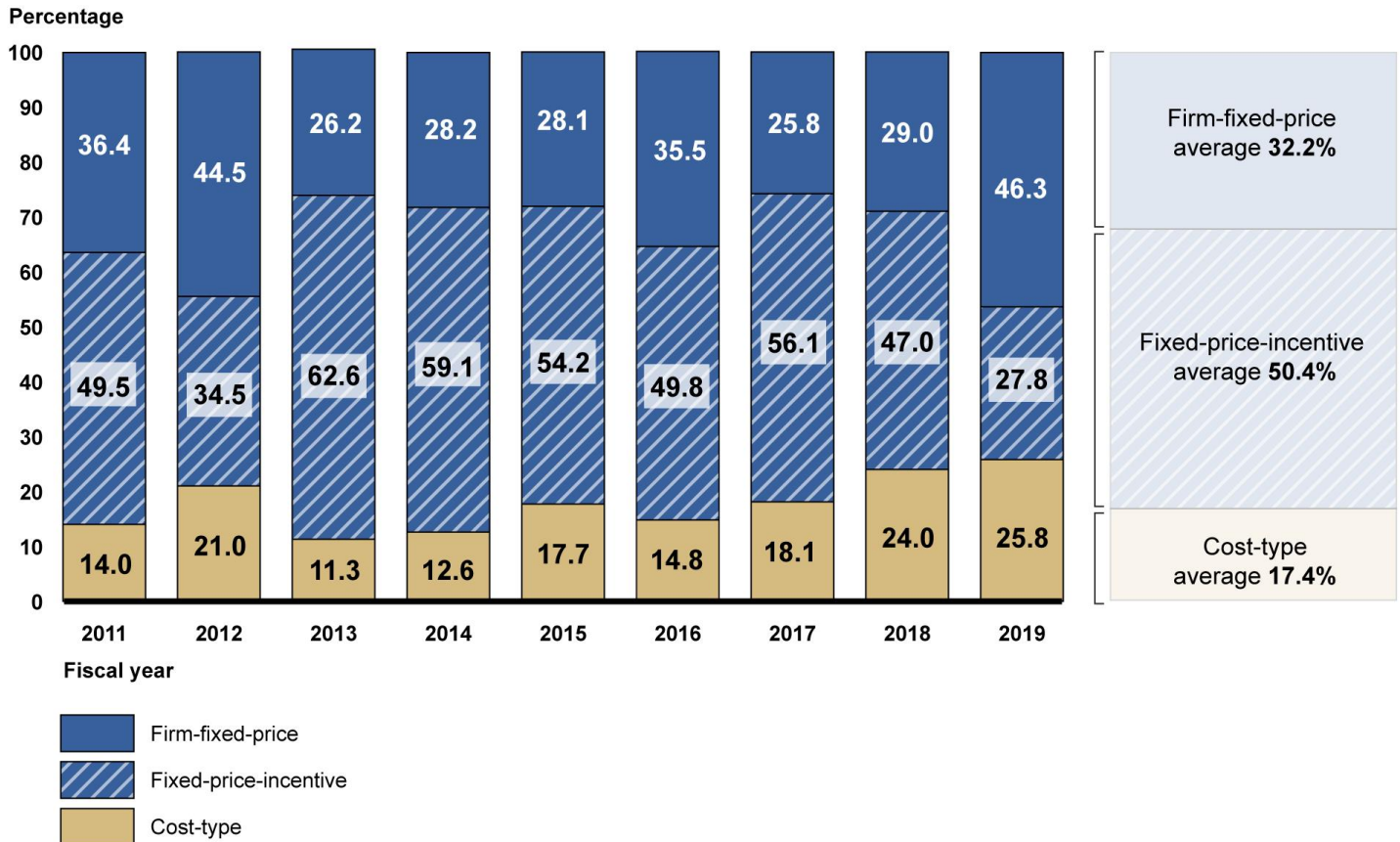
¹⁹GAO, *Weapon Systems Annual Assessment: Limited Use of Knowledge-Based Practices Continues to Undercut DOD’s Investments*, [GAO-19-336SP](#) (Washington, D.C.: May 7, 2019).

varied across the military departments.²⁰ The remainder were on fixed-price-type contracts, split between firm-fixed-price and fixed-price-incentive, as illustrated in figure 3.²¹

²⁰We analyzed FPDS-NG data regarding obligations by contract type from fiscal year 2011 through fiscal year 2019 on contracts for programs in DOD's MDAP portfolio awarded from fiscal year 2010 through fiscal year 2018. These data reflect programs that were part of DOD's MDAP portfolio and contracts that were reported in Selected Acquisition Reports at any point during this period. Dataset includes only obligations on MDAP contracts awarded since fiscal year 2010 due to problems identified in a prior GAO report regarding how data on contract types were reported in FPDS-NG for contracts awarded prior to that date. In addition, the dataset does not include two contract records reported in FPDS-NG as time-and-materials.

²¹Figure 3 includes obligations on contracts for MDAPs for which DOD is reported in DAMIR as the lead component, or for which a contract is used for multiple MDAPs across multiple military departments, in addition to the obligations reported in figure 4. Total obligations across the period on contracts for each individual military department, in fiscal year 2019 dollars, were \$79.9 billion for the Air Force, \$49.8 billion for the Army, and \$161.6 billion for the Navy.

Figure 3: Proportion of Obligations by Contract Type for Major Defense Acquisition Programs from Fiscal Years 2011 through 2019

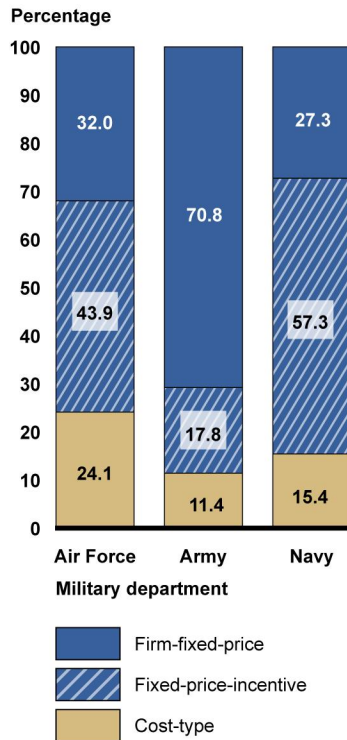


Source: GAO analysis of Federal Procurement Data System-Next Generation data. | GAO-20-352

Figure 4 illustrates the proportion of obligations by contract type for each of the military departments across the 9-year period. The Air Force made the most use of cost-type contracts, at an average of around one-quarter of obligations. While the Army made the least use of cost-type contracts, it made the most use of firm-fixed-price contracts. The Navy made the most use of fixed-price-incentive contracts. We have previously reported that the Navy has generally used cost-type contracts for lead ships and fixed-price-incentive contracts for follow-on ships.²²

²²GAO, *Navy Shipbuilding: Past Performance Provides Valuable Lessons for Future Investments*, [GAO-18-238SP](#) (Washington, D.C.: June 6, 2018).

Figure 4: Proportion of Obligations by Contract Type from Fiscal Years 2011 through 2019 for Military Department Major Defense Acquisition Programs



Source: GAO analysis of Federal Procurement Data System-Next Generation data. | GAO-20-352

Choice of Cost-Type Contracts Informed by Program Risk and Subject to Additional Risk-Based Monitoring

We found that the choice of cost-type contracts for MDAPs by contracting officers is based on assessments of program risk and uncertainty, underpinned by a number of statutory, regulatory, and policy provisions. Risk assessment also drives the application of additional reporting and surveillance requirements—designed to help the program office monitor cost and schedule performance—once DOD has awarded a cost-type contract for an MDAP.

Choice of Cost-Type Contracts Is Based on Consideration of Program Risk and Uncertainty

A range of statutory, regulatory, and policy provisions emphasize the importance of considering program risk and uncertainty when planning acquisitions and determining contract types for MDAPs. These provisions guide the decisions of contracting officers when choosing contract type and establish documentation requirements such as acquisition strategies. Table 2 describes key provisions related to program risk and uncertainty.

Table 2: Selected Provisions Concerning Choice of Contract Type and Risk

Subject area	Selected provisions	Elements relating choice of contract type to risk and uncertainty
Acquisition planning	10 United States Code (U.S.C.) § 2431a: Acquisition Strategy	<ul style="list-style-type: none"> Requires every major defense acquisition program to have an acquisition strategy that includes contract type and how it relates to level of program risk States that milestone decision authority is responsible for reviewing and approving the acquisition strategy
	Federal Acquisition Regulation (FAR) Part 7: Acquisition Planning	<ul style="list-style-type: none"> Requires preparation of a written acquisition plan for cost-type and other high-risk contracts other than firm-fixed-price contracts Notes that acquisition plan should discuss the rationale for the selection of contract type, including particular facts and circumstances such as requirements complexity, uncertain duration, and contractor's technical capability and financial responsibility
	Defense Federal Acquisition Regulation Supplement (DFARS) Part 207: Acquisition Planning	<ul style="list-style-type: none"> Generally requires preparation of written acquisition plans for development acquisitions with a total estimated cost of \$10 million or more and for production or service acquisitions with a total estimated cost of \$50 million or more, or \$25 million or more for any fiscal year
Contract choice	FAR Part 16: Types of Contracts	<ul style="list-style-type: none"> Outlines factors the contracting officer considers in selecting the contract type including requirement complexity, price competition, and cost analysis States that cost-type contracts may be used when circumstances do not allow for a fixed-price-type contract or if there are uncertainties in the contract performance that do not allow for costs to be estimated with sufficient accuracy to use a fixed-price-type contract Limits use of cost-type contracts to only those contractors with an accounting system adequate for determining costs applicable to the contract or order Requires for all incentive- and award-fee contracts completion of a determination and finding justifying that the use of this type of contract is in the best interest of the government
	FAR Part 35: Research and Development Contracting	<ul style="list-style-type: none"> States that the use of cost-type contracts for research and development is usually appropriate given the absence of precise specifications and difficulties in accurately estimating costs

Subject area	Selected provisions	Elements relating choice of contract type to risk and uncertainty
	DFARS Part 234: Major System Acquisition	<ul style="list-style-type: none"> Requires selection of contract type for development program that is consistent with program risk Requires cost-type contracts to have a written determination explaining selection of that contract type States that the milestone decision authority shall document the reasons for the contract type selection
	DFARS Procedures, Guidance, and Information 216: Types of Contracts	<ul style="list-style-type: none"> Notes that contracting officers should use fixed-price-type contracts when risk has been reduced to the extent that realistic pricing can occur, such as when a program has reached the final stages of development and technical risks are minimal
	Department of Defense (DOD) Instruction No. 5000.02T Operation of the Defense Acquisition System	<ul style="list-style-type: none"> Requires contract type and incentive structure to be tailored to the program and designed to motivate industry to perform in a manner that achieves the outcomes the government values and desires Directs the program manager to consider the use of fixed-price-type contracts when their use is cost effective and risk is sufficiently reduced
	Better Buying Power 2.0 Guidance	<ul style="list-style-type: none"> Notes that the use of a specific contract type should be governed by the nature of the work and deliverables being placed on contract, and that an appropriate allocation of risk between government and industry is a major factor and must take into account industry's ability to absorb risk
	DOD Guidance on Using Incentive and Other Contract Types	<ul style="list-style-type: none"> Illustrates the various factors that should be taken into account when selecting contract type, including stability and clarity of contract specifications and uncertainties such as technology maturity

Sources: United States Code, Federal Acquisition Regulation, and Department of Defense documents. | GAO-20-352

Contracting and program officials, among others, collaborate and determine the appropriate contract type based on assessments of risk, considering factors such as availability of historical contract information, use of new technologies, cost stability, and the level of definition of requirements, such as software. In arriving at these determinations, officials we met with noted the importance of contracting officers having experience using a range of contract types.

The seven MDAP cost-type contracts included in our review had documented rationales for their choice that all indicated areas of risk and uncertainty, addressing provisions noted in table 2.²³ For example, four were development contracts, and FAR Part 35 states that the use of cost-type contracts for research and development is usually appropriate given the absence of precise specifications and difficulties in accurately estimating costs. The other three cost-type contract rationales noted that, consistent with the FAR, uncertainties in contract performance did not

²³These rationales were captured in required documentation such as acquisition plans, acquisition strategies, and determinations and findings. These documents have review and approval requirements; for example, the milestone decision authority must approve the acquisition strategy, which includes the contracting strategy.

allow for costs to be estimated with sufficient accuracy to use a fixed-price-type contract. Table 3 summarizes these rationales.

Table 3: Rationales for Cost-Type Contract Type Choice for Seven Major Defense Acquisition Programs

Military department	Program	Contract name	Rationale cited for cost-type contract choice
Air Force	AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM)	Diminishing Manufacturing Sources and Material Shortages Refresh Phase 4A Form, Fit, Function Refresh	Technical risk and uncertainties associated with successfully completing events including test readiness review
Air Force	F-15 Eagle Passive Active Warning Survivability System (EPAWSS)	F-15 EPAWSS Engineering and Manufacturing Development	Developmental nature of tasks required, challenges associated with defining the number of new technical orders, and the magnitude of changes to existing technical orders
Army	Common Infrared Countermeasure (CIRCM)	CIRCM Engineering and Manufacturing Development	Need for flexibility to acquire nonrecurring engineering and development activities
Army	Handheld, Manpack, and Small Form Fit Radios (HMS)	Generation 1 Rifleman Radio Modification	Lack of determination of exact shipping, travel, and material requirements at time of award
Navy	CVN 78 Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78)	CVN 80 Advanced Procurement	Industrial base events such as mergers and acquisitions and swings in raw material costs creating a level of uncertainty
Navy	Joint Precision Approach and Landing System (JPALS)	JPALS Engineering and Manufacturing Development	Significant technical challenges and likelihood of unforeseen problems during design that will require unpredictable additional hours and material and costs
Navy (Marine Corps)	Ground/Air Task Oriented Radar (G/ATOR)	Ground Weapons Locating Radar G/ATOR Block 2	Uncertainty associated with software development and challenges with software integration and imprecise specifications

Source: Department of Defense. | GAO-20-352

Additional Risk-Based Reporting Requirements for Cost-Type Contracts Designed to Help Programs Monitor Cost and Schedule Performance

Contract types that shift more risk onto the government—including cost-type contracts—and exceed certain dollar thresholds have additional contractual reporting requirements. These requirements are designed to help the program office to monitor cost and schedule performance. In order to receive a cost-type or incentive contract valued at \$20 million or more, a contractor must have an earned value management (EVM) system that complies with certain guidelines. These systems integrate the scope of work with cost, schedule, and performance elements to support project planning. They also provide program offices with monthly contract performance reports that include cost and schedule status and risks. Our prior work contains recommendations related to DOD’s use of EVM. For example, in 2009 we recommended that DOD modify policies governing

EVM to ensure they addressed a number of weaknesses we had identified. In response, DOD developed and incorporated into its program management curricula a new EVM training course.²⁴

Among the duties of two specialized government contract administration agencies—DCMA and SUPSHIP—are the review and approval of contractor EVM systems, and ongoing surveillance of data generated by the systems. The regular reports provided to program offices by these agencies include EVM data and analysis and highlight areas of concern and contract performance risk.

In addition to use of EVM data, contracting officials from the seven cost-type MDAP contracts included in our review noted the importance of regular interactions between DOD—whether the program office, DCMA, or SUPSHIP—and the contractor in order to proactively identify drivers of cost or schedule overruns. These interactions can range from day-to-day tracking to comprehensive quarterly reviews. Several officials also noted the importance of having DCMA and SUPSHIP representatives on-site at contractor facilities, overseeing the contract and communicating with the contractor.

Program Outcomes Vary Regardless of Contract Type but Correspond to the Use of Knowledge to Reduce Risk

Our analysis of program cost and schedule outcomes for 21 MDAPs did not find a clear relationship between these outcomes and the contract type used. DOD's current portfolio of MDAPs contains a total of 85 programs. The 21 MDAPs in our review are the non-shipbuilding subset of the 85 that, as of January 2019, had completed system development, held a critical design review, and started production. Thus, these 21 programs are sufficiently far along the acquisition process that we can analyze their cost and schedule outcomes. We found that they demonstrated a range of cost and schedule performance, regardless of contract type chosen. Table 4 notes the contract types used for these MDAPs as well as unit cost and schedule change between each program's first full estimate and our most recent in-depth assessment of

²⁴GAO, *Information Technology: Agencies Need to Improve the Implementation and Use of Earned Value Techniques to Help Manage Major System Acquisitions*, [GAO-10-2](#) (Washington, D.C.: Oct. 8, 2009).

the program as of May 2019. As reflected in the table, all but four of the MDAPs used some mix of cost-type and fixed-price-type contracts.

Table 4: Reported Contract Types Used and Unit Cost and Schedule Change since First Full Estimate for 21 Selected Programs

Program	Percentage unit cost change	Percentage schedule change	Contract types used		
			Cost-type	Fixed-price-incentive	Firm-fixed-price
MQ-8 Fire Scout	183	122	✓	✓	✓
Ground/Air Task Oriented Radar	168	146	✓	✓	✓
F-35 Lightning II	75	35	✓	✓	X
Warfighter Information Network-Tactical Increment 2	41	48	✓	✓	✓
CH-53K Heavy Lift Replacement Helicopter	21	60	✓	✓	✓
Joint Air-to-Ground Missile	18	16	X	✓	X
MQ-4C Triton Unmanned Aircraft System	10	70	✓	✓	✓
Patriot Advanced Capability-3 Missile Segment Enhancement	10	n/a	✓	✓	X
Ship to Shore Connector Amphibious Craft	7	0	✓	✓	X
Global Positioning System III	6	n/a	✓	✓	X
M109A7 Family of Vehicles	3	13	✓	✓	X
Handheld, Manpack, and Small Form Fit Radios	2	46	✓	X	✓
Armored Multi-Purpose Vehicle	2	0	✓	X	X
Amphibious Combat Vehicle Increment 1.1	-7	0	✓	✓	✓
F-22 Increment 3.2B Modernization	-8	0	✓	X	✓
Common Infrared Countermeasure	-9	2	✓	✓	✓
Air and Missile Defense Radar	-11	3	✓	✓	X
Joint Light Tactical Vehicle	-11	15	✓	X	✓
Small Diameter Bomb Increment II	-14	53	X	✓	✓
KC-46 Tanker Modernization Program	-18	44	X	✓	✓
Offensive Anti-Surface Warfare Increment 1	-44	0	✓	✓	X

Legend:

✓ = contract type used

X = contract type not used

n/a = not applicable

Source: GAO analysis of Department of Defense data. | GAO-20-352

Note: Multiple contracts may be awarded as a program proceeds through the acquisition process. Contract types may be used in combination on a contract, with both cost-type and fixed-price-type contract line item numbers. Contract types included in the table reflect those reported in the Defense Acquisition Management Information Retrieval system or GAO's April 2018 and May 2019 annual assessments of weapon systems. Unit cost refers to the program acquisition unit cost, which is calculated by dividing the total program cost by the total quantities planned. Schedule refers to acquisition cycle time, defined as the number of months between program start and the achievement of initial operational capability or an equivalent fielding date. In some instances the acquisition cycle time could not be calculated due to program-specific reasons, and we annotate this by using the term n/a. We used unit cost and schedule data from our most recent individual assessment of each weapon system as of May 2019. Of the 21 programs, 16 were last assessed in fiscal year 2019, four were last assessed in fiscal year 2018, and one was last assessed in fiscal year 2017. First full estimate is generally the cost estimate established at development start.

Performance varied widely for programs using cost-type contracts at some stage, with unit cost change varying from 44 percent reduction to 183 percent growth, and schedule change varying from zero to 146 percent growth. In addition, while two of the three programs that used only fixed-price-type contracts had unit cost reductions, they also experienced schedule growth of over 40 percent. Programs generally made greater use of cost-type contracts than fixed-price-type contracts during development, and greater use of fixed-price-type contracts during procurement, as knowledge built over time.

While we did not find a clear relationship between contract type and cost and schedule performance, we have found a relationship between improved outcomes and implementation of certain knowledge-based acquisition practices on these 21 programs. These are practices identified in our body of prior work that ensure a high level of knowledge is achieved at key junctures in development. We apply these practices as criteria in weapon system reviews, including our annual assessment of weapon systems.²⁵ As shown in table 5 and based on analysis of the 21 programs, in general MDAPs that implemented certain knowledge practices—thus reducing risk—before the start of system development and critical design review had better unit cost and schedule outcomes than those that did not. The first such practice—completing preliminary design review before system development start—means that a program has held a review that assesses the maturity of the preliminary design, supported by the results of activities including prototyping and critical technology demonstrations. The second practice—release of at least 90 percent of drawings by critical design review—refers to the design drawings released or deemed releasable to manufacturing by that point.

²⁵[GAO-19-336SP](#).

Table 5: Knowledge-Based Acquisition Practices and Associated Performance Outcomes for 21 Selected Programs

Practice	Programs that implemented the practice	Programs that did not implement the practice	Net performance difference
Completion of preliminary design review before start of system development	<ul style="list-style-type: none"> -13.1 percent unit cost growth 11.6 percent schedule growth Implemented by six programs 	<ul style="list-style-type: none"> 33.6 percent unit cost growth 46.3 percent schedule growth Not implemented by 15 programs 	<ul style="list-style-type: none"> 46.7 percent less growth in unit cost 34.7 percent less growth in schedule
Release of at least 90 percent of drawings by critical design review	<ul style="list-style-type: none"> -5.5 percent unit cost growth 10.3 percent schedule growth Implemented by seven programs 	<ul style="list-style-type: none"> 45.1 percent unit cost growth 50.3 percent schedule growth Not implemented by 10 programs^a 	<ul style="list-style-type: none"> 50.6 percent less growth in unit cost 40.0 percent less growth in schedule

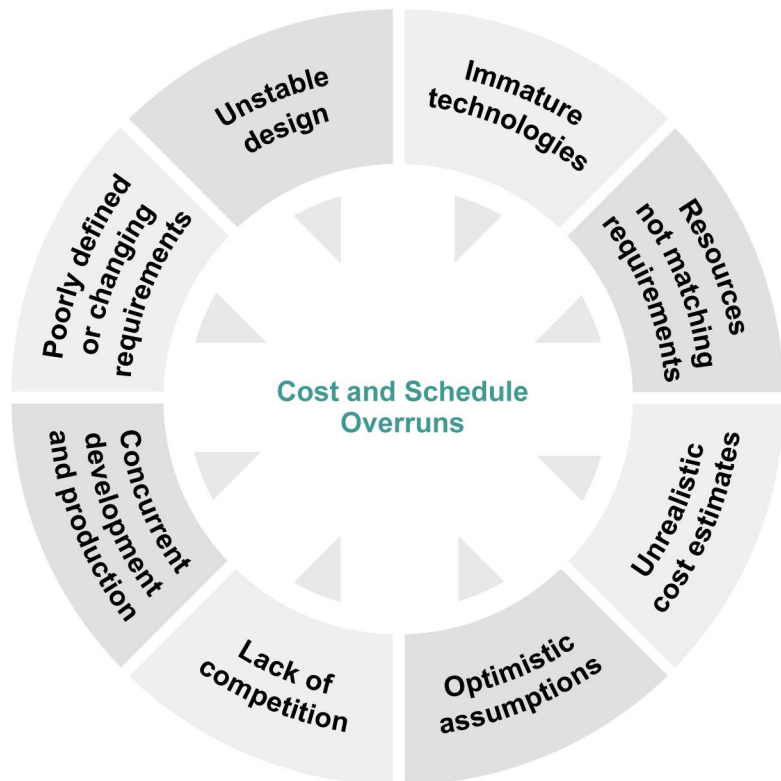
Source: GAO analysis of Department of Defense data. | GAO-20-352

Note: The differences in performance outcomes were significant at the 90 percent confidence level. Unit cost and schedule changes are measured between each program's first full estimate and GAO's most recent in-depth assessment of the program as of May 2019. Unit cost refers to the program acquisition unit cost, which is calculated by dividing the total program cost by the total quantities planned. Schedule refers to acquisition cycle time, defined as the number of months between program start and the achievement of initial operational capability or an equivalent fielding date. We used unit cost and schedule data from our most recent individual assessment of each weapon system as of May 2019. Of the 21 programs, 16 were last assessed in fiscal year 2019, four were last assessed in fiscal year 2018, and one was last assessed in fiscal year 2017. First full estimate is generally the cost estimate established at development start.

^aNumber of programs for this practice does not sum to 21 because four programs did not provide enough information to make a determination as to their implementation of the practice.

Our prior work has shown that establishing a sound business case is essential to achieving better program outcomes. A solid, executable business case provides credible evidence that the warfighter's needs are valid and can best be met with the chosen concept. The business case should also demonstrate that the chosen concept can be developed and produced within existing resources such as technologies, design knowledge, funding, and time. At the heart of a business case is a knowledge-based approach, in which knowledge supplants risk over time. Establishing a business case calls for a realistic assessment of risks and costs; doing otherwise undermines the intent of the business case and invites failure. Over the years, we have identified a number of factors that undermine business cases and drive cost and schedule overruns, several of which are illustrated in figure 5.

Figure 5: Drivers of Cost and Schedule Overruns on Major Defense Acquisition Programs



Source: GAO. | GAO-20-352

Undesirable outcomes such as cost and schedule growth reflect decisions made to move forward with programs before the knowledge needed to reduce risk and make those decisions is sufficient. For example, we have previously found that the majority of cost growth occurs after production start, which may be a sign that programs are entering production without attaining key knowledge about technology maturity, design stability, and production readiness in preceding phases of development. The primary consequences of risk are often more time and money, and these consequences flow through the acquisition phases, with unplanned overlap—known as concurrency—in development, testing, and production.

Our annual assessment of weapon systems has identified numerous examples of programs proceeding without sufficient knowledge to reduce

risk, and their subsequent cost and schedule growth.²⁶ These examples have included the following from among the 21 MDAPs reviewed in this report:

- The F-35 program started development without a match between resources and requirements and without a stable design. Critical technologies were immature, development and production occurred concurrently, and critical deficiencies were still not resolved well into production. As of May 2019, the program had experienced unit cost growth of 75 percent and schedule growth of 35 percent since its first full estimate in October 2001.
- The MQ-4C program did not achieve technology maturity or design stability prior to development start and critical design review, respectively, and developmental challenges delayed production start. As of May 2019, the program had experienced unit cost growth of 10 percent and schedule growth of 70 percent since its first full estimate in February 2009.
- The CH-53K program failed to demonstrate technology and design maturity at appropriate points earlier in system development. As of May 2019, the program had experienced unit cost growth of 21 percent and schedule growth of 60 percent since its first full estimate in December 2005.
- A year after the production decision for the Ground/Air Task Oriented Radar program, the Marine Corps revised the program's reliability requirements in response to an expert panel finding that the existing requirements did not reflect operational needs, contributing to delayed full-rate production. As of May 2019, the program had experienced unit cost growth of 168 percent and schedule growth of 146 percent since its first full estimate in August 2005.

We have identified and recommended solutions to these issues, including that MDAPs establish firm and feasible requirements, mature technologies, incremental acquisition approaches, and realistic cost estimates.²⁷ While DOD has agreed with most of our recommendations in

²⁶[GAO-19-336SP](#).

²⁷GAO, *F-35 Joint Strike Fighter: DOD Needs to Complete Developmental Testing Before Making Significant New Investments*, [GAO-17-351](#) (Washington, D.C.: Apr. 24, 2017); *Defense Acquisitions: Joint Action Needed by DOD and Congress to Improve Outcomes*, [GAO-16-187T](#) (Washington, D.C.: Oct. 27, 2015); and *Defense Acquisitions: Realistic Business Cases Needed to Execute Navy Shipbuilding Programs*, [GAO-07-943T](#) (Washington, D.C.: July 24, 2007).

these areas, it has not always implemented them. As we noted in our most recent High Risk List report, as of November 2018, 88 recommendations related to DOD weapon systems acquisition remained open.²⁸ Furthermore, while we had previously reported better cost performance on newer programs initiated after implementation of major acquisition reforms in 2010, more recently we found cost growth on those programs. We attributed the deteriorating performance of newer programs to the inconsistent implementation of knowledge-based acquisition practices, as the negative effects of entering development with insufficient knowledge cascade throughout the acquisition cycle.²⁹

Peer Review Change in 2019 Reduced a Means for Sharing Information about Contract Choice across DOD

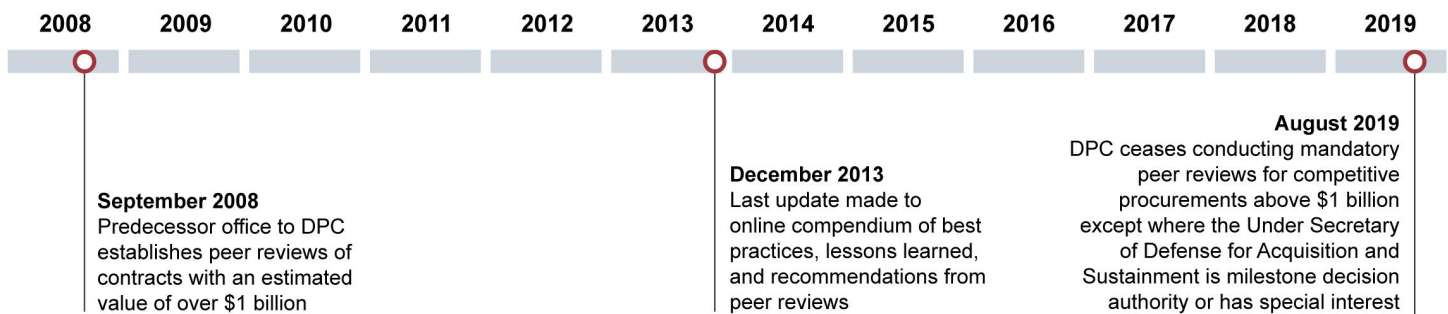
In August 2019, DPC announced that it would no longer conduct mandatory peer reviews for competitive procurements above \$1 billion, except for the small number of MDAPs for which USD(A&S) remains milestone decision authority, and other programs of special interest to USD(A&S). As part of the same announcement, DPC stated that it planned to continue to perform peer reviews for noncompetitive procurements of \$500 million or more. DPC officials expect that the procurements no longer covered by DPC's peer review will instead be covered by the military departments' own review processes, which already address competitive procurements up to \$1 billion. While these review processes exist within the military departments, there is not an active mechanism for sharing across the departments any best practices and lessons learned—including about contract choice—found in the course of the reviews. DPC does not currently have plans to address the reduced potential for information sharing resulting from this change.

Figure 6 depicts key developments related to the DPC peer reviews since their establishment in 2008, including the last update to an online compendium—a tool designed to share best practices, lessons learned, and recommendations from peer reviews across DOD—in 2013.

²⁸GAO, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019).

²⁹[GAO-19-336SP](#).

Figure 6: Developments in the Defense Pricing and Contracting (DPC) Peer Review Process



Source: Department of Defense. | GAO-20-352

According to DPC officials, updates to the compendium stopped as personnel became more familiar with the peer review process. They also noted that the change to peer reviews in 2019 resulted from resource constraints and staff reductions associated with recent acquisition reforms. The officials expect this change to reduce the number of DPC peer reviews by half to approximately 50 per year, consisting primarily of the reviews for noncompetitive procurements of \$500 million or more.

The peer review process was established with the following objectives:

1. to ensure that contracting officers across DOD consistently and appropriately implement policies and regulations;
2. to continue to improve the quality of contracting processes across DOD; and
3. to facilitate cross-sharing of best practices and lessons learned across DOD.

In support of this third objective, procedures for conducting peer reviews stated that the predecessor office to DPC would look for common trends and issues to be shared with the broader DOD contracting community, and maintain information about best practices and lessons learned on its website.³⁰ This public website currently houses the online compendium, although, as noted above, the last update was in 2013.

Contracting officials we met with noted the value of being able to learn from the experiences of officials in other military departments through

³⁰This predecessor office was called Defense Procurement and Acquisition Policy.

peer reviews. For example, contracting officials on an Air Force program that had a peer review involving Navy officials stated that lessons shared by those officials reduced the time it took to subsequently execute a contract. Officials from across the military departments cited benefits that resulted from these opportunities to learn from the real-world experience of peers across DOD, including the ability to share contracting information and expertise, review cost-sharing arrangements, and recalibrate contracting decisions.

The online compendium is a spreadsheet with a row for each example of feedback, with the program and officials concerned kept anonymous. Columns include the category of feedback (e.g., source selection, terms and conditions), the type of feedback (e.g., recommendation, lesson learned, best practice), and the phase of review (e.g., issuance of the solicitation). Our analysis of the compendium found that it captures practices and recommendations related to contract type, as illustrated by the following examples:

- **Use of incentives:** Consider development of cost and performance incentives, rather than use of an award fee.
- **Different contract type:** Reconsider plan to award a fixed-price-incentive contract, given historical use of a cost-plus-incentive-fee arrangement under which contractor delivered at or around target cost.
- **Source selection:** Throughout solicitation for an award combining firm-fixed-price and cost-type line items, tell offerors what they are expected to provide and how they will be evaluated, and document that evaluation occurred in this exact way.

Officials from the military departments confirmed that they are aware that they will now be expected to perform the reviews that DPC previously conducted. They have taken steps to adjust procedures accordingly, including updating their acquisition regulations as necessary. However, DPC does not currently have plans to encourage sharing of findings from military department-level reviews across the departments. For example, there are no plans to solicit updates to the online compendium or a similar centralized resource. USD(A&S) is responsible for improving acquisition results—including cost, schedule, and performance—by gathering and distributing data, best practices, and lessons learned across the military

departments.³¹ Without a centralized resource for sharing findings, and as most reviews transition to the military departments, it will become more difficult for USD(A&S) to identify contracting trends across DOD and perform this assigned role. An updated compendium or other centralized resource could help contracting officials continue to learn from the experiences of peers across DOD—including when acquiring similar platforms and from similar contractors—by exposing them to good practices for structuring contracts and prompting consideration of alternative contract types.

Conclusions

With DPC conducting fewer peer reviews and no updates to the compendium since 2013, contracting officials might not have insight into how other programs across DOD structure contracts. As the reviews will now primarily occur within the military departments, these officials could lose exposure to alternative contracting approaches suitable for their programs. A centralized resource such as the compendium takes on a new significance as a means for sharing information between the military departments as they proceed with their own peer reviews. USD(A&S) remains well-positioned to facilitate information exchange and contribute to positive program outcomes by requiring the military departments to share the findings of their peer reviews.

Recommendation for Executive Action

The Under Secretary of Defense for Acquisition and Sustainment should establish procedures requiring the military departments to collect and share findings from their peer reviews of MDAP contracting approaches—including choice of contract type—such as by updating the existing online compendium of best practices and lessons learned as they complete their reviews.

³¹USD(A&S) was assigned this responsibility in a July 2018 memorandum issued by the Deputy Secretary of Defense that finalized roles and responsibilities following a reorganization of the Office of the Secretary of Defense.

Agency Comments and Our Evaluation

We provided a draft of this report to DOD for review and comment. DOD concurred with our recommendation and provided written comments, which are reprinted in appendix II. DOD also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the Secretary of Defense. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4841 or oakleys@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Sincerely yours,



Shelby S. Oakley
Director, Contracting and National Security Acquisitions

Appendix I: Objectives, Scope, and Methodology

This report addresses: (1) the extent to which the Department of Defense (DOD) uses cost-type contracts for major defense acquisition programs (MDAP); (2) how DOD chooses among cost-type and other contract types for MDAPs and monitors their cost and schedule performance; (3) the range of cost and schedule outcomes across MDAPs that used cost-type contracts; and (4) the extent to which DOD shares information about choosing MDAP contract types across the military departments.¹

To assess the extent to which DOD uses cost-type contracts for MDAPs, we analyzed Federal Procurement Data System-Next Generation (FPDS-NG) data regarding obligations by contract type from fiscal year 2011 through fiscal year 2019 on contracts for programs in DOD's MDAP portfolio awarded from fiscal year 2010 through fiscal year 2018. These data reflect programs that were part of DOD's MDAP portfolio and contracts that were reported in Selected Acquisition Reports at any point during this period. The basic types of contracts may be used in combination, with both fixed-price-type and cost-type contract line item numbers, unless otherwise prohibited. Per the Defense Federal Acquisition Regulation Supplement (DFARS) Procedures, Guidance, and Information, when entering contract type information into FPDS-NG, the data entrant is to choose the contract type that is applicable to the predominant amount of the contract action, based on the value of the line items; the selected contract type automatically populates any subsequent contract action reports for modifications. We aggregated obligations on orders under indefinite-delivery contracts and basic ordering agreements by contract type for each fiscal year.

We used the Defense Acquisition Management Information Retrieval (DAMIR) system to identify those contracts reported in Selected Acquisition Reports for programs in the MDAP portfolio awarded from fiscal year 2010 through fiscal year 2018. Our dataset includes only obligations on MDAP contracts awarded since fiscal year 2010 due to

¹Cost-type contracts are also referred to as cost-reimbursement contracts. For the purposes of this report, all such contracts are referred to as cost-type contracts.

problems identified in a prior GAO report regarding how data on contract types were reported in FPDS-NG for contracts awarded prior to that date.² Specifically, prior to fiscal year 2010, data entrants could select the contract types “combination” and “other”, or not enter a contract type at all. The Office of Federal Procurement Policy subsequently removed those contract types as options in FPDS-NG, and made completion of the field mandatory. Contracts retain their original designation in FPDS-NG when modifications to those contracts are subsequently made. Therefore, in order to avoid including contracts coded as “combination” or “other”, we limited our analysis to contracts awarded since fiscal year 2010.³

We assessed data reliability by comparing the contract types identified in FPDS-NG for each contract with information on contract types contained in DAMIR and in another DOD database—Earned Value Management-Central Repository—and determined the data were sufficiently reliable for the purposes of analyzing the extent of DOD’s use of cost-type contracts for MDAPs. Contractors for programs with earned value management (EVM) reporting requirements submit EVM data to Earned Value Management-Central Repository. EVM reporting is generally required for cost-type or incentive contracts valued at \$20 million or more. We included obligations associated with contract types contained in FPDS-NG if they matched contract types contained in either DAMIR or Earned Value Management-Central Repository. When there was no match with either source, we reviewed the narrative discussion of contract types contained in Selected Acquisition Reports in order to determine the most appropriate contract type with which to label those obligations.

To assess how DOD chooses among cost-type and other contract types for MDAPs and monitors their cost and schedule performance, we reviewed relevant statutes, regulations, and policies. We analyzed documentation and interviewed officials regarding contract choice and monitoring from the following DOD and military department offices and selected contracting commands:

- Under Secretary of Defense for Acquisition and Sustainment
 - Acquisition, Analytics and Policy

²GAO, *Contract Management: Extent of Federal Spending under Cost-Reimbursement Contracts Unclear and Key Controls Not Always Used*, [GAO-09-921](#) (Washington, D.C.: Sep. 30, 2009).

³The dataset also does not include two contract records reported in FPDS-NG as time-and-materials. The total number of contracts included in the dataset is 303.

- Defense Pricing and Contracting
- Cost Assessment and Program Evaluation
- Defense Contract Management Agency
- Deputy Assistant Secretary of the Air Force for Contracting
- Deputy Assistant Secretary of the Army for Procurement
- Deputy Assistant Secretary of the Navy for Procurement
- Air Force Materiel Command
- Space and Missile Systems Center
- Army Contracting Command
- Marine Corps Systems Command
- Naval Air Systems Command
- Naval Information Warfare Systems Command
- Naval Sea Systems Command

As illustrative examples of contract choice and monitoring under a variety of conditions, including different military departments and appropriation types, we also selected a nongeneralizable sample of seven MDAP contracts. Specifically, we selected for each of the three military departments the most recently awarded cost-type MDAP Research Development, Test, and Evaluation contract and the most recently awarded cost-type MDAP Procurement contract as reported in the December 2017 Selected Acquisition Reports. We also selected the most recently awarded cost-type MDAP contract for the Marine Corps. Table 6 notes the selected MDAPs and contracts, as well as the milestone decision authority responsible for approving the acquisition strategy associated with that contract.

Appendix I: Objectives, Scope, and Methodology

Table 6: Selected Major Defense Acquisition Programs and Contracts

Military department	Program	Description	Contract name	Milestone decision authority for acquisition strategy associated with contract
Air Force	AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM)	All-weather, all-environment medium range air-to-air missile system for applications against massed penetration aircraft.	Diminishing Manufacturing Sources and Material Shortages Refresh Phase 4A Form, Fit, Function Refresh	Secretary of the Air Force
Air Force	F-15 Eagle Passive Active Warning Survivability System (EPAWSS)	Modernization of the F-15's electronic warfare system used to detect and identify threats, employ counter-measures, and jam enemy radars.	F-15 EPAWSS Engineering and Manufacturing Development	Under Secretary of Defense (Acquisition, Technology, and Logistics)
Army	Common Infrared Countermeasure (CIRCM)	Next generation lightweight, laser-based infrared countermeasure system for rotary-wing, tilt-rotor, and small fixed-wing aircraft.	CIRCM Engineering and Manufacturing Development	Under Secretary of Defense (Acquisition, Technology, and Logistics)
Army	Handheld, Manpack, and Small Form Fit Radios (HMS)	Software-defined radios that will connect with existing radios and increase the Army's communications and networking capabilities.	Generation 1 Rifleman Radio Modification	Acting Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
Navy	CVN 78 Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78)	Nuclear-powered aircraft carrier introducing new propulsion, aircraft launch and recovery, and survivability capabilities to the carrier fleet.	CVN 80 Advanced Procurement	Acting Under Secretary of Defense (Acquisition, Technology, and Logistics)
Navy	Joint Precision Approach and Landing System (JPALS)	Global Positioning System-based aircraft landing system that will allow aircraft such as the F-35 and MQ-25 to operate from aircraft carriers and amphibious assault ships.	JPALS Engineering and Manufacturing Development	Under Secretary of Defense (Acquisition, Technology, and Logistics)
Navy (Marine Corps)	Ground/Air Task Oriented Radar (G/ATOR)	Three-dimensional, short-to-medium range, multi-role radar designed to detect, identify, and track threats such as incoming cruise missiles, rockets, and artillery.	Ground Weapons Locating Radar G/ATOR Block 2	Assistant Secretary of the Navy (Research, Development, and Acquisition)

Source: Department of Defense. | GAO-20-352

We interviewed contracting officials for these programs and reviewed key documentation such as acquisition strategies relating to each one of these contracts. We also reviewed our past work related to contract types

used for MDAPs, including DOD’s use of incentive contracts and the Navy’s use of fixed-price-incentive contracts for shipbuilding.⁴

To assess the range of cost and schedule outcomes across MDAPs that used cost-type contracts, we identified the contract types as reported in DAMIR or GAO’s April 2018 and May 2019 annual assessments of weapon systems for 21 non-shipbuilding MDAPs that as of January 2019 had completed system development, held a critical design review, and started production. Table 7 notes the 21 MDAPs, as well as the dates of their first full estimate, and their most recent individual assessment by GAO as of May 2019.

Table 7: Dates Used for Analysis of 21 Department of Defense (DOD) Major Defense Acquisition Programs

Military department	Program	First full estimate	Most recent GAO assessment as of May 2019
Air Force	F-22 Increment 3.2B Modernization	06/2013	04/2018
	Global Positioning System III	05/2008	05/2019
	KC-46 Tanker Modernization Program	02/2011	05/2019
	Small Diameter Bomb Increment II	10/2010	05/2019
Army	Armored Multi-Purpose Vehicle	05/2015	05/2019
	Common Infrared Countermeasure	07/2016	05/2019
	Handheld, Manpack, and Small Form Fit Radios	05/2004	05/2019
	Joint Air-to-Ground Missile	09/2015	05/2019
	Joint Light Tactical Vehicle	10/2012	05/2019
	M109A7 Family of Vehicles	12/2011	04/2018
	Patriot Advanced Capability-3 Missile Segment Enhancement	08/2004	04/2018
	Warfighter Information Network-Tactical Increment 2	10/2007	03/2017
DOD	F-35 Lightning II	10/2001	05/2019
Navy	Air and Missile Defense Radar	10/2013	05/2019
	Amphibious Combat Vehicle Increment 1.1	05/2016	05/2019
	CH-53K Heavy Lift Replacement Helicopter	12/2005	05/2019
	Ground/Air Task Oriented Radar	08/2005	05/2019
	MQ-4C Triton Unmanned Aircraft System	02/2009	05/2019
	MQ-8 Fire Scout	12/2006	04/2018

⁴GAO, *Defense Contracting: DOD Needs Better Information on Incentive Outcomes*, [GAO-17-291](#) (Washington, D.C.: July 11, 2017); and *Navy Shipbuilding: Need to Document Rationale for the Use of Fixed-Price Incentive Contracts and Study Effectiveness of Added Incentives*, [GAO-17-211](#) (Washington, D.C.: Mar. 1, 2017).

Military department	Program	First full estimate	Most recent GAO assessment as of May 2019
	Offensive Anti-Surface Warfare Increment 1	03/2016	05/2019
	Ship to Shore Connector Amphibious Craft	07/2012	05/2019

Source: Department of Defense and GAO. | GAO-20-352

We compared the contract types reported in DAMIR or GAO’s annual assessments of weapon systems with the percentage unit cost and schedule change between the first full estimate and our most recent in-depth assessment of each program as of May 2019. Since 2018, as part of our annual assessment of weapon systems, we have conducted a statistical analysis evaluating programs’ completion of knowledge-based acquisition practices and corresponding performance outcomes.⁵ Our report cites results of this analysis as it pertains to these 21 MDAPs.⁶ We reviewed prior GAO work on the drivers of cost and schedule overruns for MDAPs.⁷

To assess the extent to which DOD shares information about choosing MDAP contract types across the military departments, we reviewed DOD and military department documentation related to contracting review processes. We compared this information to DOD memorandums establishing practices and policies for sharing of acquisition information across DOD. We also interviewed officials from offices including Defense Pricing and Contracting within the Office of the Under Secretary of Defense for Acquisition and Sustainment, and the cognizant Deputy Assistant Secretaries of the military departments.

We conducted this performance audit from February 2019 to May 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our

⁵GAO, *Weapon Systems Annual Assessment: Limited Use of Knowledge-Based Practices Continues to Undercut DOD’s Investments*, [GAO-19-336SP](#) (Washington, D.C.: May 7, 2019); and *Weapon Systems Annual Assessment: Knowledge Gaps Pose Risks to Sustaining Recent Positive Trends*, [GAO-18-360SP](#) (Washington, D.C.: Apr. 25, 2018).

⁶The differences in performance outcomes were significant at the 90 percent confidence level.

⁷GAO, *F-35 Joint Strike Fighter: DOD Needs to Complete Developmental Testing Before Making Significant New Investments*, [GAO-17-351](#) (Washington, D.C.: Apr. 24, 2017); *Defense Acquisitions: Joint Action Needed by DOD and Congress to Improve Outcomes*, [GAO-16-187T](#) (Washington, D.C.: Oct. 27, 2015); and *Defense Acquisitions: Realistic Business Cases Needed to Execute Navy Shipbuilding Programs*, [GAO-07-943T](#) (Washington, D.C.: July 24, 2007).

findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Comments from the Department of Defense



ACQUISITION
AND SUSTAINMENT

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

Ms. Shelby Oakley
Director, Contracting and National Security Acquisitions
U.S. Government Accountability Office
441 G Street, NW
Washington DC 20548

Dear Ms. Oakley:

This is the Department of Defense (DoD) response to GAO Draft Report, GAO-20-352, "COST-TYPE CONTRACTS: Procedures Needed for Sharing Information on Contract Choice Among Military Departments" dated April 2, 2020 (GAO Code 103372).

DoD concurs with the draft report's recommendation that "The Under Secretary of Defense for Acquisition and Sustainment should establish procedures requiring the military departments to collect and share findings from their peer reviews of the Major Defense Acquisition Program (MDAP) contracting approaches--including choice of contract type--such as by updating the existing online compendium of best practices and lessons learned as they complete their reviews."

My point of contact is Mr. Michael Pelkey who can be reached at michael.f.pelkey.civ@mail.mil or 703-614-1253.

Sincerely,

HERRING

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507719313

Kim Herrington

Acting Principal Director,

Defense Pricing and Contracting

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Agency Comment Letter

Text of Appendix II: Comments from the Department of Defense

Page 1

Ms. Shelby Oakley
Director, Contracting and National Security Acquisitions
U.S. Government Accountability Office
441 G Street, NW
Washington DC 20548

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My point of contact is Mr. Michael Pelkey who can be reached at michael.f.pelkey.civ@mail.mil or 703-614-1253.

Sincerely,

Kim Herrington
Acting Principal Director,
Defense Pricing and Contracting

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Shelby S. Oakley, (202) 512-4841 or oakleys@gao.gov

Staff Acknowledgments

In addition to the contact named above, Raj Chitikila (Assistant Director), Robert Bullock, Jenny Chanley, Jasmina Clyburn, Andrea Evans, Lori Fields, Suellen Foth, Kurt Gurka, Stephanie Gustafson, and Grace Haskin made key contributions to this report.

Appendix IV: Accessible Data

Data Tables

Data Table for Figure 3: Proportion of Obligations by Contract Type for Major Defense Acquisition Programs from Fiscal Years 2011 through 2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019	Averages
Firm fixed price	36.4%	44.5%	26.2%	28.2%	28.1%	35.5%	25.8%	29.0%	46.3%	32.2%
Fixed price incentive	49.5%	34.5%	62.6%	59.1%	54.2%	49.8%	56.1%	47.0%	27.8%	50.4%
Cost type	14.0%	21.0%	11.3%	12.6%	17.7%	14.8%	18.1%	24.0%	25.8%	17.4%

Data Table for Figure 4: Proportion of Obligations by Contract Type from Fiscal Years 2011 through 2019 for Military Department Major Defense Acquisition Programs

	Air Force	Army	Navy
Firm fixed price	32.0%	70.8%	27.3%
Fixed price incentive	43.9%	17.8%	57.3%
Cost type	24.1%	11.4%	15.4%

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