United States Government Accountability Office

Report to the Committee on Armed Services, U.S. Senate

March 2019

DEFENSE ACQUISITIONS

Information on Workforce, Organizational Structure, and Budgeting for Selected Programs

Accessible Version

GAO-19-209

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GAO Highlights

Highlights of GAO-19-209, a report to the Committee on Armed Services, U.S. Senate

Why GAO Did This Study

In 2018, DOD estimated that its 82 major defense acquisition programs would cost over $1.69 trillion in total to acquire. DOD relies on program offices—composed of civilian, military and contractor support personnel—to manage and oversee these technically complex programs.

GAO was asked to review factors affecting DOD's personnel needs for its acquisition programs and how DOD budgets for the costs associated with these personnel.

This report describes (1) factors affecting the workforce size, composition, and mix of contractor and government personnel, as well as organizational structure for selected programs; and (2) how personnel costs associated with those selected programs are included in DOD's budget justification documents.

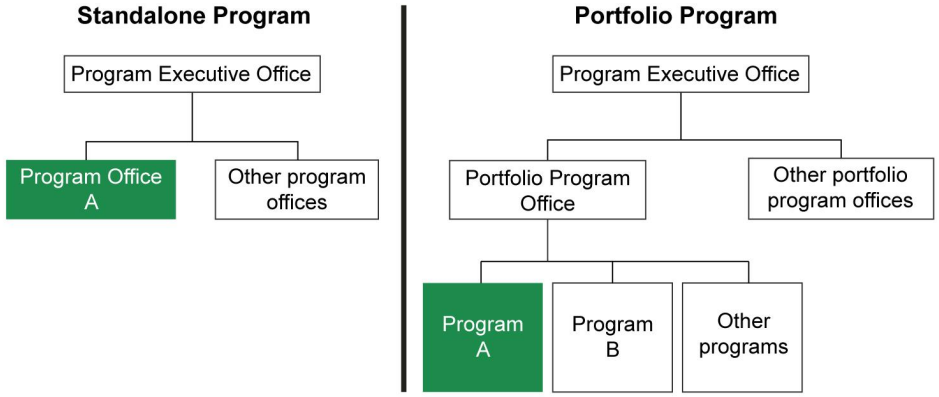
GAO reviewed DOD acquisition, workforce, and financial management policies and regulations and identified a non-generalizable sample of 11 major defense acquisition programs, including programs from each military department that were recently approved to enter into system development. GAO requested information from each of these programs to identify the number and type of personnel supporting the program, reviewed program documentation, and interviewed program officials. GAO also reviewed DOD's budget justification documents for fiscal years 2018 and 2019.

View GAO-19-209. For more information, contact Timothy J. DiNapoli at (202) 512-4841 or DinapoliT@gao.gov.

What GAO Found

The workforce size, composition, and mix, as well as the organizational structure of the 11 Department of Defense (DOD) major defense acquisition programs GAO reviewed were influenced by several interrelated factors. These factors include the government's role in developing and integrating key technologies, the availability of government personnel to provide the skills needed, and whether the program was managed as part of a portfolio of related programs or as a stand-alone program. For example, programs that assumed more responsibility for developing and integrating key technologies generally had a larger workforce, which was primarily composed of engineering and technical personnel. Program officials GAO met with stated that they generally prefer to use government personnel, but use contractor support when the number of government personnel allocated to the program is not sufficient to meet their needs, the technical skills are not available or are limited within the government, or to fulfill short-term tasks that are too brief to justify hiring government personnel. GAO also found that DOD structured the 11 programs to allow them to leverage available personnel with the necessary skills. Two programs were structured as standalone programs because they were new, high priority, and complex. The other nine programs were managed as a part of a portfolio of related programs. For example, the Air Force's F-15 program office manages a number of programs that add capabilities to the existing system.

Notional Comparison of Program Organizational Structures



Source: GAO presentation of Army and Air Force organization charts. | GAO-19-209

DOD's Financial Management Regulation, which governs the formulation and presentation of DOD's budget request, gives DOD flexibility in how it submits program personnel costs. Consequently, the personnel costs for the 11 programs GAO reviewed were not separately and distinctly identified from other costs. For example, costs for civilian and military personnel are often centrally funded through appropriations categories that support many DOD activities and do not provide information on specific program personnel costs. GAO also found that costs for contractor support are often combined with other costs in individual program budget exhibits.

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Abbreviations

AMPV	Armored Multi-Purpose Vehicle
CIRCM	Common Infrared Countermeasure
Columbia	Columbia Class Ballistic Missile Submarine
DMS-M	B-2 Defensive Management System Modernization
DOD	Department of Defense
EPAWSS	F-15 Eagle Passive Active Warning and Survivability System
FFRDC	Federally Funded Research and Development Center
JAGM	Joint Air-to-Ground Missile
JPALS	Joint Precision Approach and Landing System
MGUE	Military Global Positioning System User Equipment
NGJ Mid-Band	Next Generation Jammer Mid-Band
PEO	Program Executive Office
PIM	Paladin Integrated Management
PMA	Program Management Administration
PPBE	Planning, Programming, Budgeting, and Execution Process

T-AO	John Lewis Class Fleet Replenishment Oiler

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
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March 25, 2019

The Honorable James M. Inhofe
Chairman
The Honorable Jack Reed
Ranking Member
Committee on Armed Services
United States Senate

Each year the Department of Defense (DOD) spends billions of dollars to develop, produce, and field its weapon systems. In 2018, DOD estimated that its 82 major defense acquisition programs would cost over $1.69 trillion to develop and procure. These programs range from adding new capabilities to older platforms, like the B-2 bomber, to developing new weapon systems, such as the Columbia Class Ballistic Missile Submarine. DOD establishes program offices to manage and oversee the development, production, and sustainment of these technically complex acquisition programs. To support its programs, DOD relies on a workforce consisting of military and civilian personnel, such as program managers, contracting officers, and engineers. These government personnel are also supported by contractor personnel and other organizations.

You asked us to review issues related to how military departments meet program personnel needs and how DOD budgets for the costs associated with these personnel. This report describes (1) factors affecting the workforce size, composition, and mix, as well as organizational structure for selected major defense acquisition programs and (2) how personnel costs associated with those selected programs are included in DOD's budget justification documents. For the purposes of this report, we refer to the group of government and contractor support personnel dedicated to and responsible for managing and supporting system acquisitions as a "program," rather than a program office.

To address both objectives, we used data collected as part of our annual assessment of DOD weapon programs to identify major defense acquisition programs that were at similar phases in DOD's acquisition

process.[1] DOD Instruction 5000.02, the overarching policy governing the operation of the defense acquisition system, requires that programs entering the system development phase of the acquisition process provide an estimate, among other things, of their personnel needs.[2] We selected 11 programs, representing each military department, that were most recently approved to enter system development as of March 2018. The 11 programs we selected follow:

- **Department of the Air Force**
  - F-15 Eagle Passive Active Warning and Survivability System (EPAWSS)
  - B-2 Defensive Management System Modernization (DMS-M)
  - Military Global Positioning System User Equipment (MGUE)
- **Department of the Army**
  - Armored Multi-Purpose Vehicle (AMPV)
  - Paladin Integrated Management (PIM)
  - Common Infrared Countermeasure (CIRCM)
  - Joint Air-to-Ground Missile (JAGM)
- **Department of the Navy**
  - Next Generation Jammer Mid-Band (NGJ Mid-Band)
  - Joint Precision Approach and Landing System (JPALS)
  - John Lewis Class Fleet Replenishment Oiler (T-AO)

[1]GAO, *Weapon Systems Annual Assessment: Knowledge Gaps Pose Risks to Sustaining Recent Positive Trends*, GAO-18-360SP (Washington, D.C.; April 25, 2018). Major 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. See DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Jan. 7, 2015) (incorporating Change 4, Aug. 31, 2018). See also 10 U.S.C. § 2430.

[2]See DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Jan. 7, 2015) (incorporating Change 4, Aug. 31, 2018). Following completion of any needed technology maturation and risk reduction efforts, DOD approves programs to proceed to system development, referred to as the engineering and manufacturing development phase of the defense acquisition process. The “development decision” or decision to award a contract, is referred to as a “Milestone B” decision.

- Columbia Class Ballistic Missile Submarine (Columbia)[3]

The results from these 11 case studies are not generalizable to all 82 major defense acquisition programs, but we used them to better understand and illustrate the factors that influence a program's size, composition, and mix, as well as organizational structure.

We used a standardized data collection instrument to obtain program personnel data on three workforce characteristics for each of the 11 programs:

- **Size**—the overall number of full-time equivalent personnel, including military, civilian, contractor support, and Federally Funded Research and Development Center (FFRDC) personnel supporting the program.[4]
- **Composition**—the acquisition functions performed by personnel supporting the program and the resulting skill mix. We grouped these functions into four categories: (1) program management; (2) engineering and technical; (3) logistics; and (4) contracting, business, and support.
- **Mix**—the type of personnel supporting the program, including military, civilian, contractor and FFRDC personnel. For the purposes of this report, "contractor" refers to the support contractors who provide technical and administrative services to DOD's major defense acquisition programs rather than prime contractors that develop and produce those weapon systems or products.

[3]For additional information on these programs, see GAO-18-360SP.

[4]Full-time equivalent (FTE) is a standard measure of labor that equates to one year of full-time work (labor hours as defined by the Office of Management and Budget Circular A-11 each year). See OMB Circular No. A-11, Sec. 85 (2018). Military refers to uniformed active duty and reserve personnel employed by DOD. Civilian refers to federal government employees of DOD directly hired under permanent or temporary appointment. Contractor refers to contractor support personnel defined as non-government personnel acquired via a contract vehicle to provide specific skill sets to an organization for a specified period of time. FFRDCs are government-funded entities that have long-term relationships with one or more federal agencies to perform research and development and related tasks. FFRDCs are typically entirely federally funded, or nearly so, but they are operated by contractors or other nongovernmental organizations. As described in the Federal Acquisition Regulation (FAR), FFRDCs meet special long-term research or development needs of the sponsoring agencies that cannot be met as effectively by existing federal or non-FFRDC contractor resources. See 48 C.F.R. § 35.017(a)(2).

DOD officials stated that program personnel often change over time; therefore, the associated data we collected are not static. The data reported to us by the 11 selected programs provided a snapshot—as reported between December 2017 and June 2018—of the personnel supporting the program. To assess the consistency and reliability of these data, we interviewed officials from each of the 11 programs to determine how the data were derived and compared the data with available program documentation that addressed workforce requirements, such as acquisition strategies, cost analysis documents, and organizational charts. Based on these steps, we determined that the data were sufficiently reliable to identify and compare the programs' workforce size, composition, and mix.

To describe the organizational structure of the selected programs, we reviewed some of the documentation required to proceed to the system development phase of the defense acquisition process. We also reviewed organizational charts and interviewed officials representing each of the selected programs. To identify the factors affecting workforce size, composition, and mix of the selected programs, we obtained and reviewed program documentation, including acquisition strategies. We interviewed officials from each of the selected programs as well as the following DOD organizations that were involved in the policy and process of manpower planning for acquisition programs:

- Office of the Under Secretary of Defense for Personnel and Readiness;
- Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology;
- Army Program Executive Office Ground Combat Systems;
- Army Program Executive Office Intelligence, Electronic Warfare and Sensors;
- Army Program Executive Office Missiles and Space;
- Air Force Life Cycle Management Center;
- Air Force Space and Missile Systems Center;
- Naval Sea Systems Command; and
- Naval Air Systems Command.

Based on the discussions with program officials and review of acquisition-related documents, we identified the overarching factors that affected the

workforce size, composition, and mix, as well as the organizational structure of the selected programs.

To identify how personnel costs for the 11 selected programs are included in DOD's budget justification documents, we reviewed the DOD Financial Management Regulation that governs DOD input to the President's annual budget request, among other things.[5] We reviewed relevant DOD portions of the fiscal years 2018 and 2019 President's Budget and the specific budget exhibits for each of the 11 programs.[6] We also interviewed officials from Office of the Under Secretary of Defense (Comptroller), the military departments, and Program Executive Office (PEO), and program officials responsible for developing the budget request for the 11 selected programs to obtain information on how military departments budget for their personnel.[7]

We conducted this performance audit from November 2017 to March 2019 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.

Background

DOD acquires new weapons for its warfighters through a management process known as the defense acquisition process.[8] This process has multiple phases, including: (1) technology maturation and risk reduction, (2) engineering and manufacturing development, and (3) production and

[5]DOD 7000.14-R, *Department of Defense Financial Management Regulation.*

[6]Budget exhibits are documents prepared to justify budget requests to Congress.

[7]Program Executive Offices (PEOs) are responsible for all aspects of life-cycle management of their assigned programs. DOD policy states that a Program Executive Officer must be appointed for Acquisition Category (ACAT) I programs to provide dedicated executive management to acquisition programs. See DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Jan. 7, 2015) (incorporating Change 4, Aug. 31, 2018).

[8]See DOD Directive 5000.01, *The Defense Acquisition System* (May 12, 2003) (incorporating Change 2, Aug. 31, 2018); DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Jan. 7, 2015) (incorporating Change 4, Aug. 31, 2018).

deployment.[9] In this report we refer to these three phases as concept development, system development, and production. Programs typically complete a series of milestone reviews and other key decision points that authorize entry into a new acquisition phase.

DOD Instruction 5000.02 delegates responsibility for developing and procuring weapon systems to the military departments and other defense agencies. This policy does not specify a standard organizational structure—or program structure—to manage acquisition programs, but rather states that programs are to be tailored as much as possible to the characteristics of the product being acquired, and to the totality of circumstances associated with the program including operational urgency and risk factors.[10] In addition, DOD's guidance for managing its workforce states that the approach should be flexible, adaptive to program changes, and responsive to new management strategies.[11]

DOD decides how many personnel and how much program funding to request for each military department through the Planning, Programming, Budgeting, and Execution (PPBE) process.[12] DOD programming policy requires the military departments and defense agencies to develop a program objective memorandum that identifies and prioritizes requirements and total funding needs for the current budget year and 4 additional years into the future.[13] As a part of this process, the

[9]GAO-18-360SP.

[10]See DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Jan. 7, 2015) (incorporating Change 4, Aug. 31, 2018).

[11]See DOD Directive 1100.4, *Guidance for Manpower Management* (Feb. 12, 2005).

[12]DOD Directive 7045.14, *The Planning, Programming, Budgeting, and Execution (PPBE) Process* (Jan. 25, 2013).

[13]In 2016, we reviewed how DOD plans for acquiring contracted services. We found that even though DOD commands and program offices we met with had information on the contracted services they expected to purchase beyond the budget year, they were not required to present that information in the program objective memorandum. To ensure that senior leadership within the Office of the Secretary of Defense and the military departments are better positioned to make informed decisions regarding the volume and type of services that should be acquired beyond the budget year, we recommended that each military department revise programming guidance to collect that information. DOD generally concurred with the recommendation, but as of July 2018, only the Army has developed such guidance. For more information on DOD's Planning, Programming, Budgeting, and Execution process, see GAO, *DOD Service Acquisitions: Improved Use of Available Data Needed to Better Manage and Forecast Service Contract Requirements*, GAO-16-119 (Washington, D.C.; Feb. 18, 2016).

departments also estimate the personnel requirements and program funding needed to execute their mission, including support for the commands and PEOs that are responsible for managing acquisition programs. The results of the PPBE process, including proposed funding levels for programs, are captured in the President's annual budget request to Congress. For example, in its budget request, DOD identifies and requests the total number of civilian full-time equivalent personnel, among other things. Congress then authorizes and appropriates the funding to pay for civilian personnel for each military department. When budgeting for contracted services, DOD estimates the cost of the tasks to be performed but not the number of individuals that may perform those tasks. The military departments, commands and PEOs then distribute approved funding (which, in part, is used to pay for civilian personnel and contractor support) to the various organizations including the programs that are responsible for managing and supporting defense acquisitions.

Each military department has a different approach to developing its budget request, and program budgets may be spread across multiple types of appropriations that are organized into various categories based on their purpose such as research, development, testing and evaluation, or procurement. Similarly, the military departments fund their personnel through several different types of appropriations, including (1) operation and maintenance; (2) military personnel; and (3) research, development, test, and evaluation. Requests for funding are included in different documents and often presented in multiple volumes that can be hundreds of pages long. DOD's Financial Management Regulation provides instructions for the formulation and presentation of the budget request to Congress, including general categories of costs that might be included in program specific budgets. In addition, the regulation requires DOD components to include specific budget exhibits for certain acquisition programs to provide more insight into those programs' funding needs.

Several Factors Affect the Workforce Size, Composition, and Mix, As Well As the Organizational Structure of Selected DOD Acquisition Programs

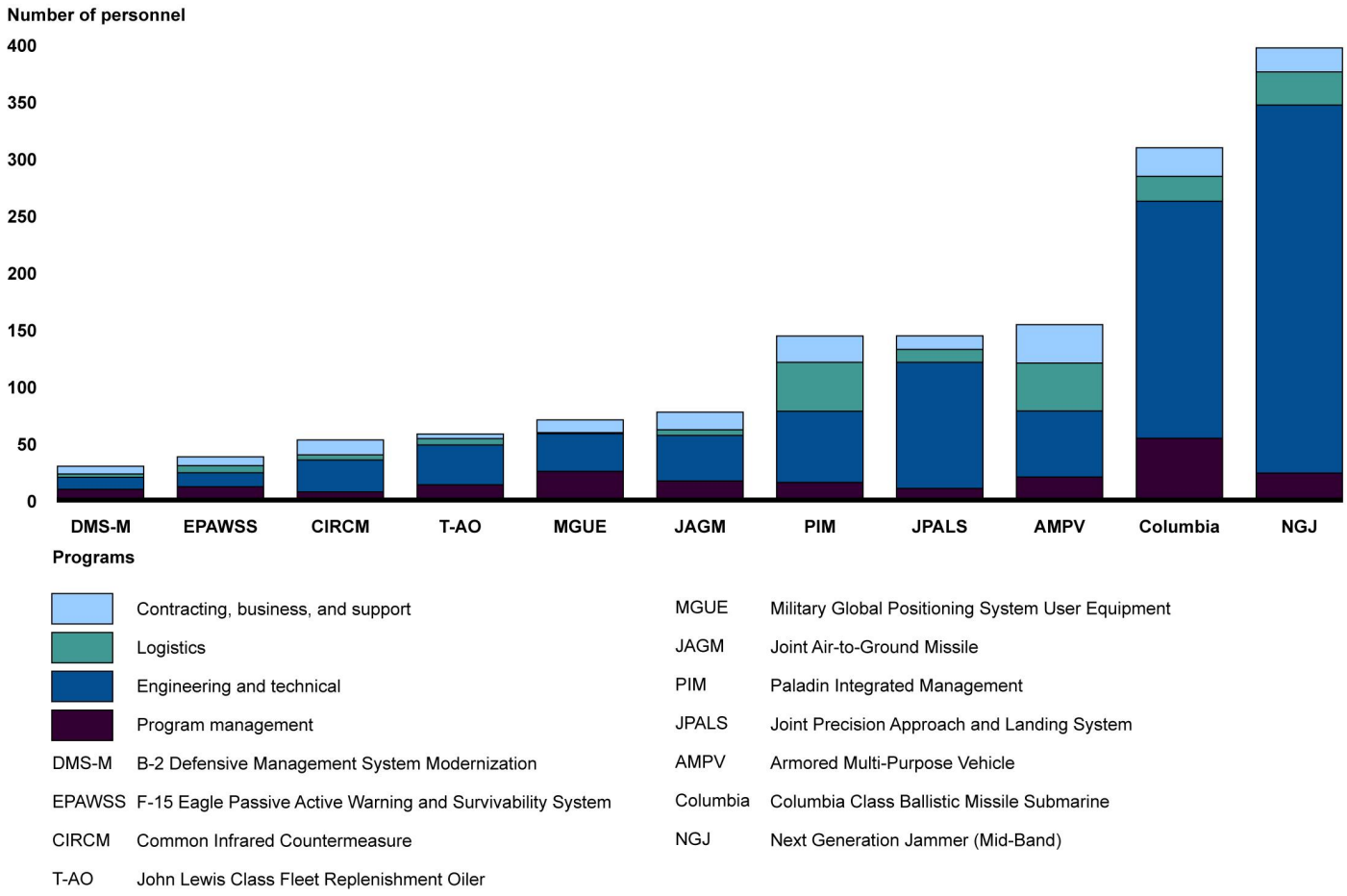
Several interrelated factors influenced the workforce size, composition, and mix, as well as the organizational structure of the 11 major defense acquisition programs we reviewed. We found the following:

- Program workforce size and composition were influenced by the degree to which the program assumed responsibility for technical development and integration, as well as the program's stage within the acquisition life cycle.
- Program workforce mix varied depending on the use of contractor personnel, which was based on the workload requirements and the availability of government personnel to provide the skills needed.
- Programs were generally structured as either stand-alone—new, high priority, complex weapon system platforms with dedicated personnel—or as part of a portfolio of related programs to share personnel across programs.

Factors Affecting Selected Programs' Workforce Size and Composition

The number and composition of personnel that supported the selected major defense acquisition programs varied considerably. As shown in figure 1, the total number of personnel supporting the 11 selected programs ranged from 30 to 397, and the composition of those personnel varied based on the needs of the program.

Figure 1: Program Workforce Size and Composition Varied for the 11 Department of Defense Major Defense Acquisition Programs GAO Reviewed



Source: GAO analysis of Department of Defense data. | GAO-19-209

Notes: The workforce numbers presented include personnel assigned directly to the program office as well as personnel from other organizations that provide support to the program. For example, Next Generation Jammer Mid-Band program officials stated that they are a larger program, in part, because of the program's role in performing a portion of system development and integration.

Personnel numbers include military, civilian, contractor support, and Federally Funded Research and Development Center Personnel identified as full-time equivalents or by a similar measure.

While program officials cited a number of factors that influenced the selected programs' workforce size and composition, including department priority and complexity, we identified two overarching factors—(1) the level of program responsibility for technical development and integration, and (2) the stage of the acquisition life cycle.

First, we found programs that assume more responsibility for technical development and integration have more personnel—primarily those that perform engineering as well as test and evaluation functions. The two largest of the selected programs we reviewed, the Navy's Next-Generation Jammer Mid-Band (NGJ Mid-Band) and Columbia Class Ballistic Missile Submarine (Columbia), assumed significant responsibility for system development and integration, activities a prime contractor often undertook for the other programs we reviewed. For example,

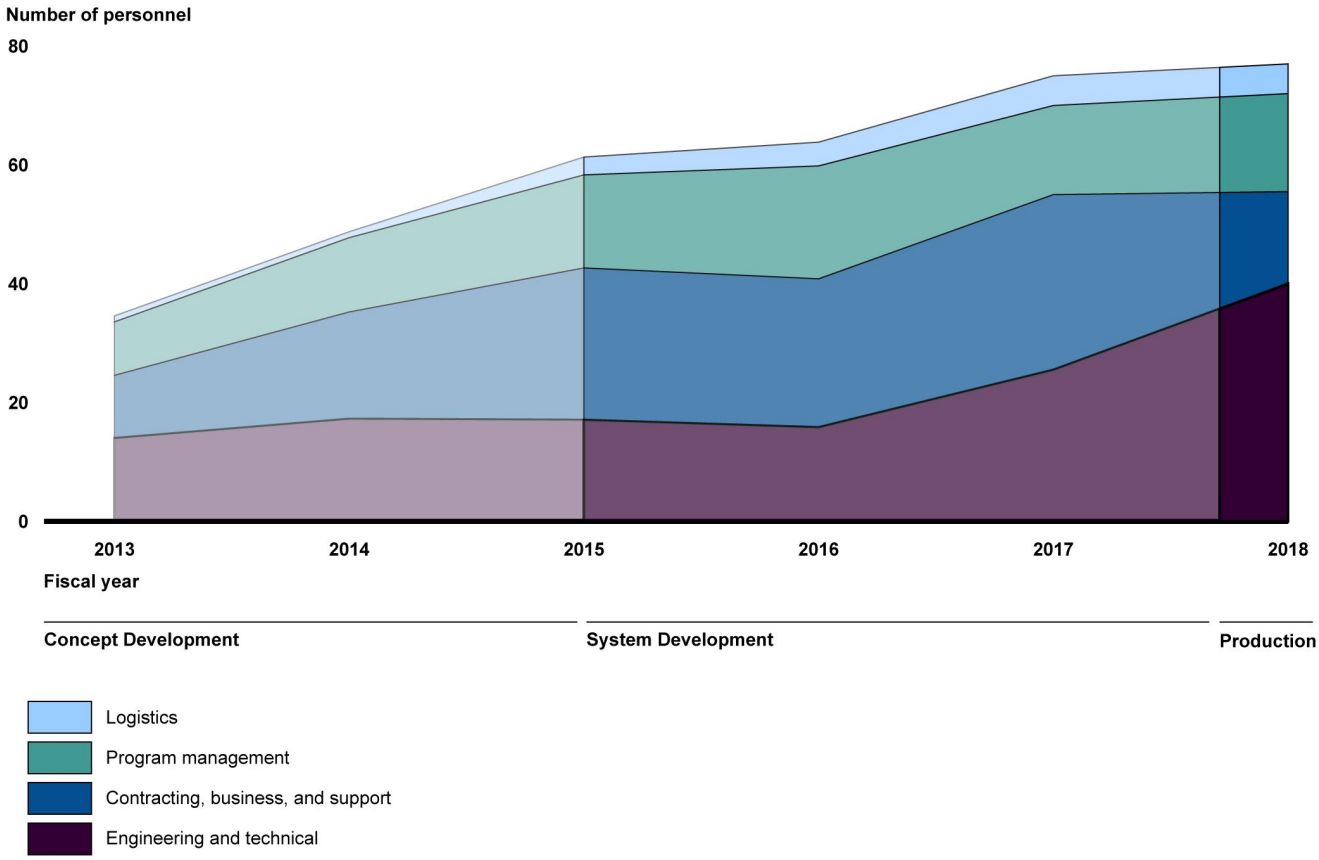
- NGJ Mid-Band officials explained that the program is responsible for overseeing software integration and other efforts directly. In this case, in addition to personnel assigned to the program office, the Navy relies on personnel from other organizations such as the Naval Air Warfare Center Aircraft Division instead of a prime contractor to develop the software needed to operate the system, conduct system testing, and manage integration into the platform.
- Similarly, the Columbia program maintains responsibility for many aspects of development and integration of the submarine including most hull, mechanical, and electrical components. As a result, about two-thirds of the 309 personnel supporting the program are performing engineering and technical tasks.

In contrast, two programs with fewer personnel, the Air Force's B-2 Defensive Management System Modernization program (DMS-M) and Navy's John Lewis Class Fleet Replenishment Oiler (T-AO), assigned significant responsibility for development and integration to their respective prime contractors. The Defensive Management System Modernization program reported to us that it has a total of 11 engineering and technical personnel, and T-AO reported that it has 35 engineering and technical personnel.

Secondly, we found that program workforce size and composition changed in response to the amount and nature of the work programs perform at different stages of the acquisition life cycle. For example, officials from our selected programs stated they generally planned to increase in size as they progressed from concept development to system development and also planned to concurrently increase the proportion of engineering and technical personnel. Program officials stated that as the program progresses into the logistics support stage, the number of personnel supporting the program generally decreases as programs release some personnel to other assignments while retaining enough personnel to manage the logistics support stage. Figure 2 shows how the

size and composition of Army's Joint-Air-to-Ground Missile (JAGM) program changed from concept development into production.

Figure 2: Changes to the Workforce Size and Composition of the Joint-Air-to-Ground Missile Program from Fiscal Years 2013 through 2018



Source: GAO analysis of Department of Defense documentation and data. | GAO-19-209

Notes: Army's Joint-Air-to-Ground Missile program officials told us they expect the number of personnel to decrease after the production stage.

Personnel numbers include military, civilian, and contractor support personnel identified as full-time equivalents.

A program's total development and procurement cost was not necessarily related to the number of personnel supporting the program for the 11 programs we reviewed. All 11 selected programs are classified as major defense acquisition programs and ranged in total acquisitions cost from $1.5 billion to $103.2 billion. Our analysis, shown in table 1 below, indicates that total cost did not significantly influence the number of personnel supporting these programs.

Table 1: Total Program Acquisition Cost and Number of Personnel for 11 Selected Major Defense Acquisition Programs GAO Reviewed

Program	Program cost (dollars in billions)	Personnel
B-2 Defensive Management System Modernization (Air Force)	2.8	30
F-15 Eagle Passive Active Warning Survivability System (Air Force)	2.7	38
Common Infrared Countermeasures (Army)	2.7	53
John Lewis Class Fleet Replenishment Oiler (Navy)	9.0	58
Military GPS User Equipment (Air Force)	1.5	70
Joint Air-to-Ground Missile (Army)	6.2	77
Paladin Integrated Management (Army)	7.7	144
Joint Precision Approach and Landing System (Navy)	1.9	144
Armored Multi-Purpose Vehicle (Army)	11.6	154
Columbia Class Ballistic Missile Submarine (Navy)	103.2	309
Next Generation Jammer Mid-Band (Navy)	8.1	397

Source: GAO analysis of Department of Defense data. | GAO-19-209

Notes: Program costs were calculated using total development and procurement cost reported in December 2017 Selected Acquisition Reports and are shown in fiscal year 2019 dollars.

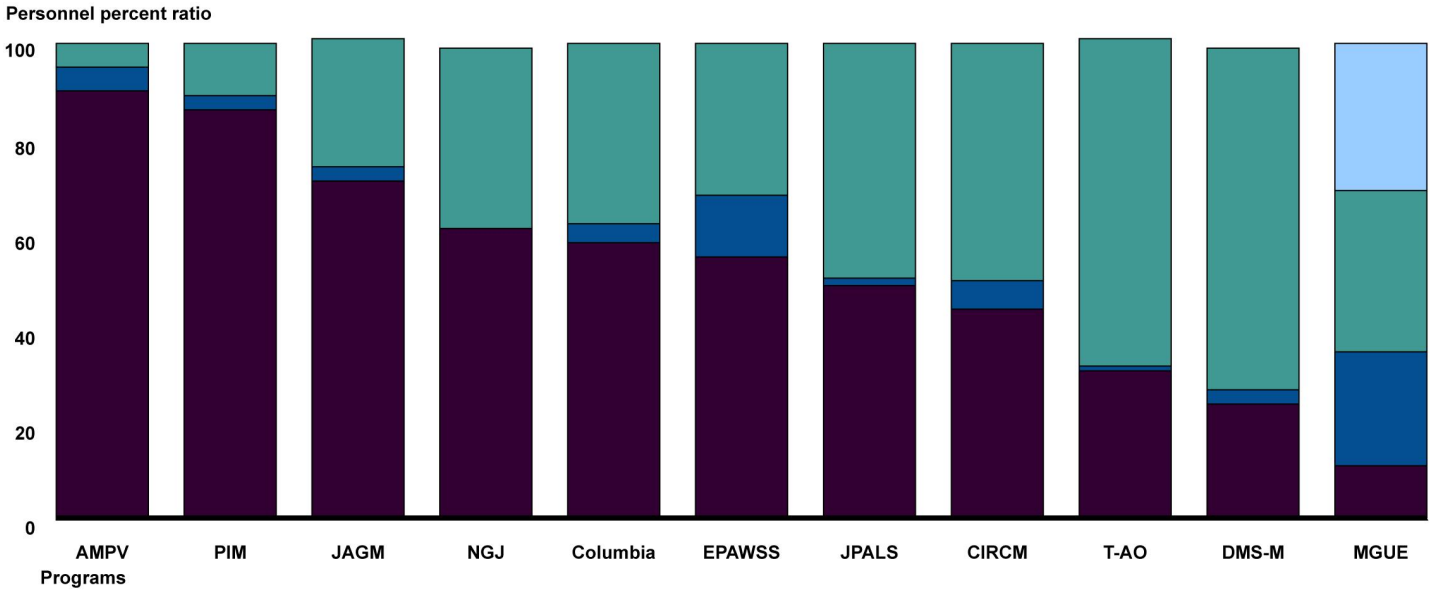
Personnel numbers in the table include military, civilian, contractor support and Federally Funded Research and Development Center personnel identified as full-time equivalents or by a similar measure. These numbers include personnel assigned directly to the program office as well as personnel from other organizations that provide support to the program.

Personnel data were reported to us by DOD and were current as of the dates the data were reported to us, which was between December 2017 and June 2018.

Selected Programs Used Contractor Support to Help Meet Workload Requirements

All 11 selected programs used contractors to help meet workload requirements, but the level of contractor support varied from approximately 5 percent to 72 percent of total program personnel, as shown in figure 3.

Figure 3: Workforce Mix Varied for 11 Selected Major Defense Acquisition Programs GAO Reviewed



Federally Funded Research and Development Center
Contractor support
Military
Civilian

AMPV	Armored Multi-Purpose Vehicle
PIM	Paladin Integrated Management
JAGM	Joint Air-to-Ground Missile
NGJ	Next Generation Jammer (Mid-Band)
Columbia	Columbia Class Ballistic Missile Submarine
EPAWSS	F-15 Eagle Passive Active Warning and Survivability System
JPALS	Joint Precision Approach and Landing System
CIRCM	Common Infrared Countermeasure
T-AO	John Lewis Class Fleet Replenishment Oiler
DMS-M	B-2 Defensive Management System Modernization
MGUE	Military Global Positioning System User Equipment

Source: GAO analysis of Department of Defense data. | GAO-19-209

Note: Personnel numbers include military, civilian, contractor support and Federally Funded Research and Development Center personnel identified as full-time equivalents or by a similar measure. The workforce numbers presented include personnel assigned directly to the program office as well as personnel from other organizations that provide support to the program.

Program officials told us that while they generally try to use civilian or military personnel to meet workload requirements, they use contractor support when the number of government personnel allocated to the program is not sufficient to meet their needs, the technical skills are not available or are limited within the government, or to fulfill short-term tasks that are too brief to justify hiring government personnel.

- Program officials stated the extent to which their programs use contractor support often depends on the number civilians allocated to the program by the command or PEO. In the case of the three selected programs with the fewest personnel, the officials stated that the number of personnel authorizations allocated to the program by their respective command or PEO did not meet their estimated workload requirements. For example, the B-2 Defensive Management System Modernization program estimated it needed 82 personnel in fiscal year 2018, but was only allocated 13 personnel. As a result, program officials stated that they used program funds to pay for contractor support personnel to partially offset the government civilian staffing shortfalls. Officials at the Air Force Life Cycle Management Center, the organization that allocated personnel to the B-2 program office, told us that civilian personnel are allocated based on the risk associated with each program.
- Program officials told us that contractor support personnel are used to augment civilian and military personnel by providing skills or technical expertise that are limited or not available in the government. We found that over two-thirds of the contractors that supported the 11 selected programs we reviewed were performing engineering and technical functions.[14] For example, the John Lewis Class Fleet Replenishment Oiler (T-AO) is a commercially-derived ship design. As such, program officials stated that the required engineering expertise resides in the commercial sector, which resulted in contracted engineers comprising about 77 percent of the program's total engineering personnel.
- Program officials also stated that it is more effective to use contractor support personnel to perform tasks that are relatively short in duration than to go through the lengthy process of hiring government personnel. Contracting for support allows the program to grow and shrink to meet personnel requirements as they change. For example,

[14]In December 2015, we found that DOD did not have enough personnel to perform engineering functions. GAO, *Defense Acquisition Workforce: Actions Needed to Guide Planning Efforts and Improve Workforce Capability*, GAO-16-80 (Washington, D.C.: Dec. 14, 2015).

Joint Air-to-Ground Missile program officials stated they contracted for support to execute tasks that are not recurring, such as developing the required documents to get approval to start production.

Among the 11 programs we reviewed, the Air Force's Military Global Positioning System User Equipment (MGUE) program has a unique workforce mix. Twenty-four percent of MGUE's program personnel were military, and MGUE was the only one of the 11 selected programs that had FFRDC personnel. Program officials stated that the challenge of obtaining civilian personnel with the required technical skills in a high cost-of-living area around Los Angeles, California required the program to rely more heavily on military personnel and contractors to support the program. Program officials stated this is in part because it is easier to assign military personnel in high cost-of-living areas than it is to hire civilian personnel. In addition, programs in the Air Force's Space and Missile Systems Center often rely on FFRDC personnel from Aerospace Corporation, which is located in the Los Angeles area and provides technical expertise that is specific to space systems.[15] Program officials from the other 10 programs we reviewed reported that they did not have FFRDC personnel.[16]

Military Departments Structured Selected Acquisition Programs to Leverage Available Personnel with the Necessary Skills

While differences existed in the organizational structure of the 11 programs we reviewed, we identified factors that affected which of the two common approaches the military departments used to leverage available personnel with the necessary skills:

- New, high priority, complex weapon system platforms that require a significant amount of development and integration, such as the Navy's Columbia and the Army's Armored Multi-Purpose Vehicle, are

[15]DOD's September 2017 Workforce Rationalization Plan states that, over the long-term, however, government civilians are frequently the most cost-effective labor solution; contractors are often more expensive than civilians, and military personnel are the most expensive form of labor once all factors are included.

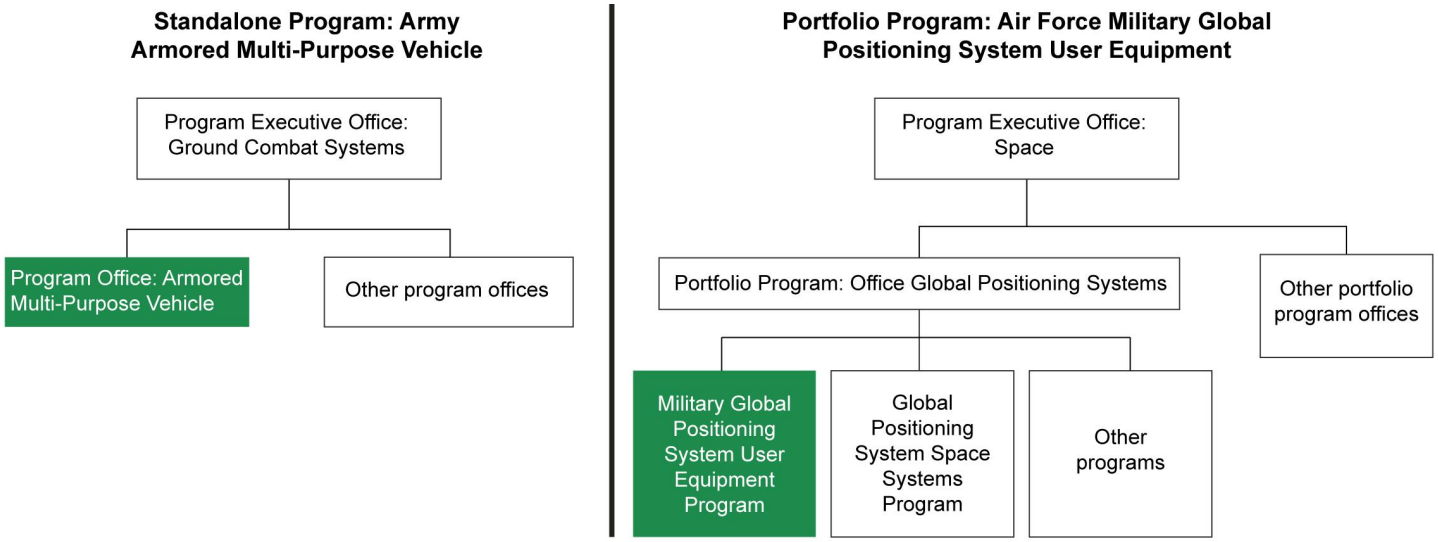
[16]In March 2019, GAO assessed DOD's space acquisition workforce. GAO, *Defense Space Systems: DOD Should Collect and Maintain Data on Its Space Acquisition Workforce,* GAO-19-240 (Washington, D.C.: Mar. 14, 2019).

structured as distinct standalone program offices with dedicated program personnel.

- Nine of the 11 selected programs were managed in a portfolio-based program structure which included multiple related acquisition programs. For these portfolio-based programs, personnel were shared across the related programs to help meet fluctuating workload requirements and maximize personnel resources.

Figure 4 compares the structure of a standalone program to the structure of a portfolio-based program with multiple acquisition programs managed under it. The figure also illustrates how the Air Force's MGUE program was situated within the Air Force's Global Positioning Systems portfolio of programs.

Figure 4: Comparison of the Structure of the Armored Multi-Purpose Vehicle Program with the Structure of the Military Global Positioning System User Equipment Program



Source: GAO presentation of Army and Air Force organization charts. | GAO-19-209

In both types of organizational structures illustrated above, the PEO and the program office have personnel that oversee and support the programs. These personnel may be dedicated to one program or may split time between multiple portfolio-based programs. For example, the Air Force PEO for Space has more than 5,000 military, civilian, and contractor personnel and is responsible for managing 41 programs, the responsibility for which is distributed among multiple program offices. One of these program offices, the Global Positioning Systems program office, has 628 personnel. This program office is responsible for overseeing and

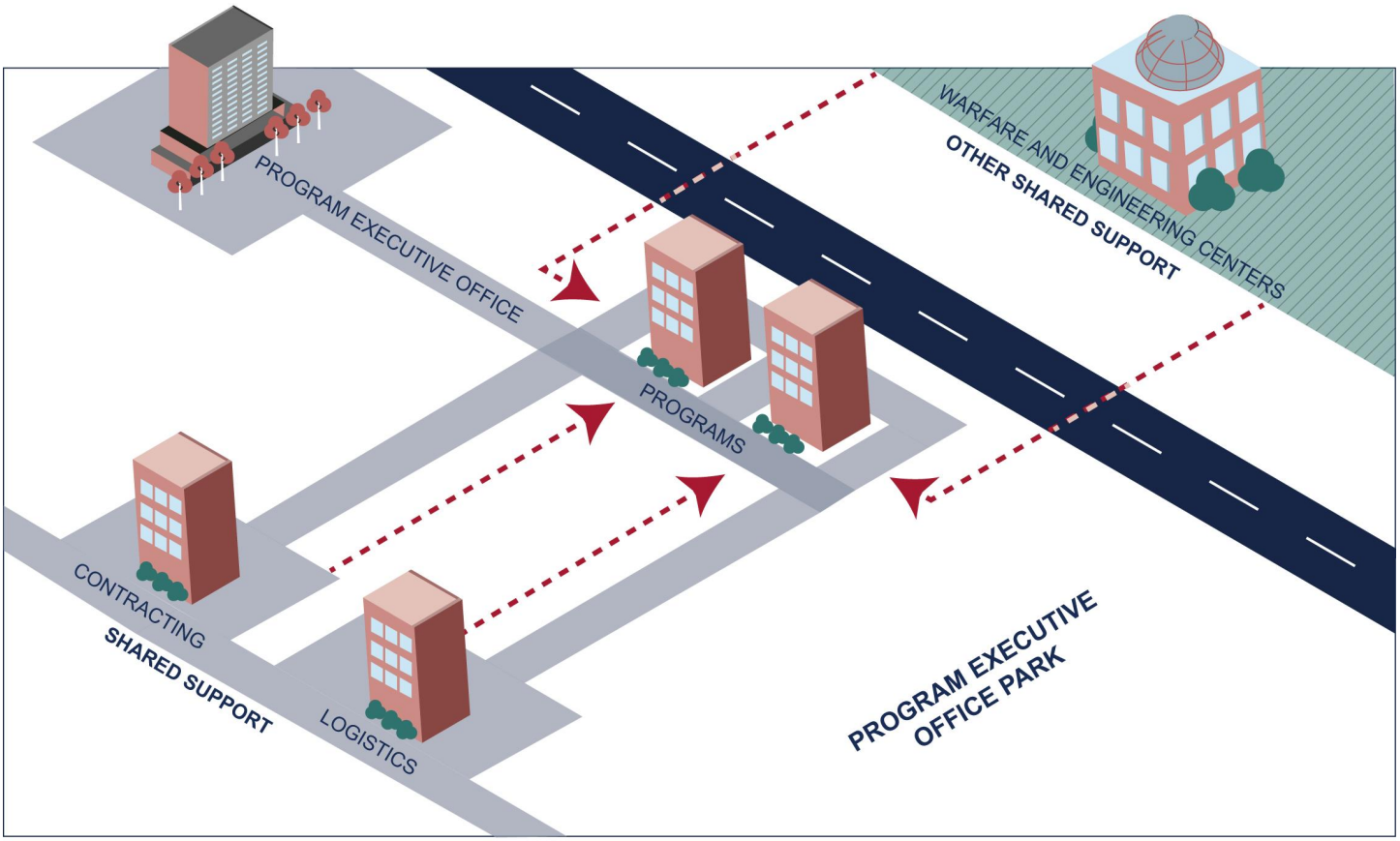
supplementing the staff of several programs, including the Military Global Positioning System User Equipment Program, which has about 70 personnel.

According to PEO and program officials, acquisition programs may be managed within portfolios for several different reasons:

- **Programs are part of the same weapon system platform.** The B-2 Defensive Management System Modernization program and the F-15 Eagle Passive Active Warning Survivability System program are examples of upgrades to existing systems on mature aircraft and are managed within a portfolio of programs within the B-2 and F-15 system program offices, respectively.
- **Programs have interrelated technologies.** The Air Force's MGUE program is managed within the GPS program office, which also manages other GPS satellite and ground system programs.
- **Programs have related acquisition strategies.** The Navy's John Lewis Class Fleet Replenishment Oiler (T-AO) program is managed within a portfolio of commercially designed and developed ships. This program is managed within a program office that oversees approximately 85 types of commercially derived auxiliary ships, boats, service craft, and special mission ships.

Regardless of how the acquisition program is structured, other DOD organizations also provide personnel to support a program's workload requirements. There are various specialized DOD organizations that support programs and provide specific acquisition functions or skill sets, such as contracting, cost estimating, and engineering. For the 11 selected programs we reviewed, these organizations supported multiple programs and were either structured (1) within the PEO that was responsible for the programs we reviewed or (2) external to the PEO. These external support organizations include contracting commands, warfare centers, and engineering organizations that are intended to provide the program specialized technical expertise from across the military department. Program officials stated that these organizations may share personnel with a program on a full or part-time basis, and the shared personnel may or may not be co-located with the program. Figure 5 is a notional representation of the way that programs are supported by different organizations.

Figure 5: Notional Department of Defense Acquisition Program Support Relationships



Source: GAO analysis of Department of Defense documentation. | GAO-19-209

The major defense acquisition programs we reviewed used different approaches to organizing and leveraging support organizations. For example:

- The Navy programs we reviewed relied on naval warfare centers to provide the engineering expertise necessary to design, build, maintain, and repair the Navy's aircraft, ships, and submarines. For example, the Navy's NGJ Mid-Band relies heavily on warfare centers, including the Naval Air Warfare Center Weapons Division and the Naval Air Warfare Center Aircraft Division, to support the program. We found that about 60 percent of the total number of personnel supporting the program office were from these organizations.

- The Army programs we reviewed relied on support organizations such as the Army Contracting Command for contracting functions, the Aviation and Missile Research Development and Engineering Center for engineering expertise, and others to provide life cycle management support.
- The Air Force programs we reviewed relied on support organizations established within their command. For example, Air Force's Life Cycle Management Center has organizations dedicated to supporting all of its programs. These organizations provide support, such as contracting and cost estimating expertise, to programs managed under the Air Force's Life Cycle Management Center. Personnel within these organizations are not staffed to one particular program, but share their time among many of the programs the Center is responsible for managing.

Personnel Costs for Selected DOD Acquisition Programs Are Included in Multiple Parts of the Budget Justification Documents and Are Not Specifically Identified for Individual Programs

The personnel costs for each major defense acquisition program we reviewed are included in different parts of the President's annual budget request, including budget justification documents, but are not always clearly identifiable due to different approaches used to report such costs. The DOD Financial Management Regulation gives the military departments flexibility in how they submit program personnel costs. For example, it suggests the use of "typical" personnel cost categories for research, development, test, and evaluation programs to include in their individual program budget exhibits, but it also allows the departments to use the personnel cost categories they deem to be the most appropriate when formulating the budget request.[17] In reviewing DOD's budget requests for fiscal years 2018 and 2019 associated with the 11 selected programs, we found that personnel costs are budgeted for in two main ways—centrally by the military department, or by an individual program—depending on whether the requests are for military, civilian, or contractor support services. Personnel costs that are program-funded are included in individual program budget justification requests, whereas

[17] DOD 7000.14 – R, *Department of Defense Financial Management Regulation*.

personnel costs that are centrally funded by the military departments are aggregated into one or more line items in the military department's specific appropriation request. Table 2 shows how each military department funds military and civilian personnel and contractor support services for major defense acquisition programs.

Table 2: Funding Approach of Program Personnel and Contractor Support for 11 Selected Major Defense Acquisition Programs by Military Department as of Fiscal Year 2019

Personnel type	Air Force	Army	Navy
Military	Central[a]	Central	Central
Civilian	Central	Central and program[b]	Central and program
Contractor support or Federally Funded Research and Development Center Personnel	Program	Program	Program

Source: GAO analysis of DOD budget documents | GAO-19-209

[a]Central refers to personnel costs that are funded through accounts that are centrally managed by the military departments. These accounts fund multiple activities and do not identify funding for individual acquisition programs.

[b]Program refers to personnel costs that are funded by an individual acquisition program.

Each military department centrally budgets for military personnel through its respective Military Personnel appropriation requests, which aggregate personnel funding. These requests include funding for pay, travel, and other personnel-related costs. As these costs are combined and not associated with a specific program, we could not determine the costs of the military personnel supporting the 11 selected programs by reviewing DOD's budget justification documentation. In contrast, support contractor costs were included in each program's individual budget request.

The military departments also centrally budget for some civilian personnel, but there are differences between the departments regarding which appropriations categories they use to request these funds. Regardless of the appropriation, we found that the budget requests do not identify civilian personnel costs by specific program; therefore, we could not determine the costs of the centrally funded civilian personnel supporting the 11 programs we selected. For example, in fiscal year 2019, the Air Force requested funding for the civilian personnel supporting its acquisition programs in development through the Research, Development, Test, and Evaluation appropriation. It grouped the costs into eight categories that represent various missions such as Cyber, Network, and Business Systems; Global Battle Management; and Nuclear Systems. The Air Force budget request indicates the total amount of

funds requested, but does not identify the estimated number of personnel that these funds will support. Figure 6 illustrates how the Air Force requested funds for its civilian acquisition workforce in fiscal year 2019.

Figure 6: Air Force Fiscal Year 2019 Research, Development Test, and Evaluation Budget Exhibit for Acquisition Personnel

Department of the Air Force
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 3600F Research, Development, Test & Eval, AF

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
137	0605826F	Acq Workforce- Global Power	06	233,924		233,924	U
138	0605827F	Acq Workforce- Global Vig & Combat Sys	06	263,488		263,488	U
139	0605828F	Acq Workforce- Global Reach	06	153,591		153,591	U
140	0605829F	Acq Workforce- Cyber, Network, & Bus Sys	06	232,315		232,315	U
141	0605830F	Acq Workforce- Global Battle Mgmt	06	169,868		169,868	U
142	0605831F	Acq Workforce- Capability Integration	06	226,219		226,219	U
143	0605832F	Acq Workforce- Advanced Prgm Technology	06	38,400		38,400	U
144	0605833F	Acq Workforce- Nuclear Systems	06	125,761		125,761	U

Source: Air Force Research, Development, Test and Evaluation budget justification for fiscal year 2019. | GAO-19-209

Note: This figure is an exact image of the budget exhibit presented to Congress. Acquisition workforce costs are presented by mission and not by the acquisition programs they support.

The Navy and Army request funds for civilian personnel primarily through their respective operation and maintenance appropriations. This appropriation is used to fund a wide range of costs necessary to manage, operate and maintain worldwide facilities and military operations.[18] These operation and maintenance budgets are divided into numerous categories

[18]According to Army officials, prior to fiscal year 2019, the Army funded civilian program personnel through each program's budget request.

related to various missions, functions, or activities. For example, the Navy's Operation and Maintenance budget requests funding for civilian personnel in several categories, such as "Ship Operational Support and Training" and "Administration." The Army Operation and Maintenance budget requests funding for civilian acquisition personnel in one combined category labeled as "Other Service Support."

Apart from the portions of the budget described above, certain DOD programs have specific budget exhibits that identify its funding requirements.[19] In reviewing the exhibits for the 11 selected programs, we found that individual program requests include personnel costs that are not funded centrally such as contractor support services costs, but these costs are generally not specifically identified as personnel costs. For example, according to program officials, the Air Force's B-2 Defensive Management Modernization program requested funds in its exhibit accompanying the fiscal year 2019 Research Development, Test, and Evaluation budget request labeled "PMA," which stands for Program Management Administration. According to program officials, PMA includes costs for contractor support services, government travel, and other costs but does not include civilian personnel costs (see figure 7).

Figure 7: Air Force B-2 Defensive Management Modernization Program Fiscal Year 2019 Research Development, Test and Evaluation Budget Request

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force

Management Services ($ in Millions)

				FY2017		FY2018		FY2019
Cost Category Item	**Contract Method and Type**	**Performing Activity and Location**	**Prior Years**	**Cost**	**Award date**	**Cost**	**Award date**	**Cost**
Software Integration H-1B	WR	XXXXXX	####	####	MM/DD/YYYY	####	MM/DD/YYYY	####
PMA	Various	Various: Various, NV	32.699	9.937	Dec 2016	11.957	Nov 2017	19.320
Software Integration H-1B	WR	XXXXXX	####	####	MM/DD/YYYY	####	MM/DD/YYYY	####
Software Integration H-1B	WR	XXXXXX	####	####	MM/DD/YYYY	####	MM/DD/YYYY	####

Source: Air Force Research, Development, Test and Evaluation budget justification for fiscal year 2019. | GAO-19-209

Note: "PMA" stands for Program Management Administration. According to program officials, PMA includes costs for contractor support services, government travel, and other costs but does not include civilian personnel costs.

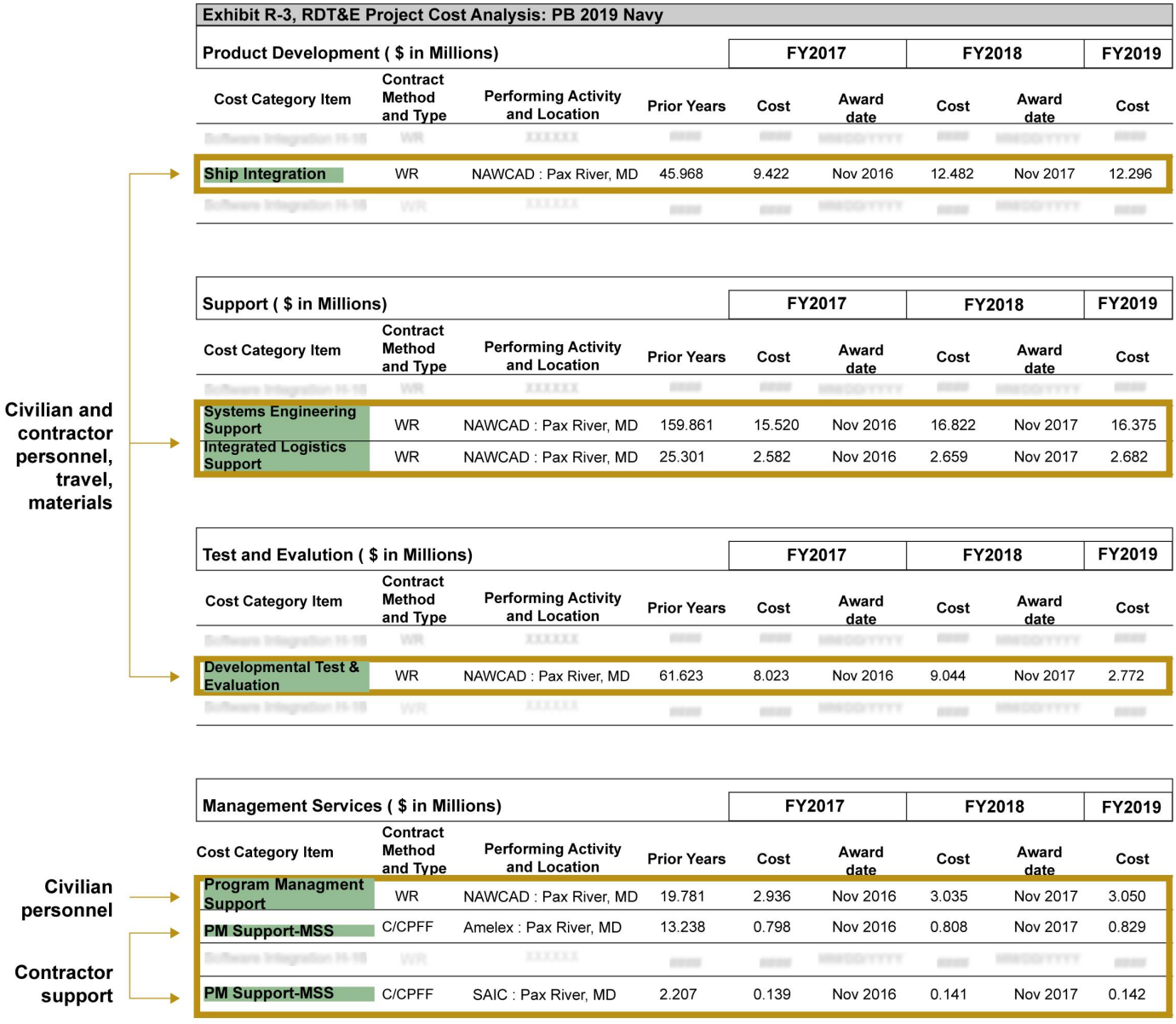
[19]DOD's Financial Management Regulation requires that all applicable budget exhibits are prepared for those programs with a budget year funding value of $5 million or greater.

In reviewing and discussing the budget exhibits for the 11 selected programs with program officials, we found that personnel costs, including civilian, contractor, and FFRDC, were generally spread across multiple budget request lines that were associated with various tasks but were not specifically identified as personnel costs. These include the following:

- Program Management Support
- Engineering Services
- Systems Engineering
- Development Test & Evaluation
- Software Integration
- Ship Integration
- Government Management
- Integrated Logistics Support

For example, the Navy's Joint Precision Approach and Landing System's fiscal year 2019 Research Development, Test and Evaluation budget exhibit included personnel costs across seven lines that represented various efforts including ship integration, test and evaluation, systems engineering, and program management support, as shown in figure 8.

Figure 8: Navy Joint Precision Approach and Landing System's Fiscal Year 2019 Research Development, Test, and Evaluation Budget Request



Source: Research, Development, Test and Evaluation budget justification for fiscal year 2019. | GAO-19-209

Of the 11 program's fiscal year 2019 budgets we reviewed, one identified personnel costs on a single line, and the remaining 10 programs included personnel costs in two or more budget lines.

Agency Comments

We provided a draft of this report to DOD for comment. DOD provided technical comments that we incorporated into this report as appropriate.

We are sending copies of this report to the appropriate congressional committees; the Acting Secretary of Defense and the Secretaries of the Army, Navy, and Air Force, as well as the Under Secretary of Defense for Personnel and Readiness. 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 dinapolit@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 II.

Timothy J. DiNapoli
Director, Contracting and National Security Acquisitions

Appendix I: GAO Contact and Staff Acknowledgments

GAO Contact

Timothy J. DiNapoli, (202) 512-4841 or dinapolit@gao.gov

Staff Acknowledgments

In addition to the contact named above, Justin Jaynes (Assistant Director); Bradley Terry (Analyst-in-Charge); Matthew T. Crosby; Stephanie Gustafson; Heather B. Miller; Karen Richey; Miranda Riemer; Robin Wilson; and Chris Zakroff made significant contributions to this review.

Appendix II: Accessible Data

Data Tables

Accessible Data for Figure 1: Program Workforce Size and Composition Varied for the 11 Department of Defense Major Defense Acquisition Programs GAO Reviewed

Programs	Program management	Engineering and technical	Logistics	Contracting, business, and support
DMS-M	9.25	10.5	3	6.7
EPAWSS	11.5	12.3	6.2	7.8
CIRCM	7	28	4.5	13
T-AO	13.2	34.9	5.7	4
MGUE	25	33	1	11.2
JAGM	16.5	40	5	15.5
PIM	15.25	62.5	43	23
JPALS	10	110.67	11.3	11.95
AMPV	20	58	42	33.75
Columbia	54.023	208.053	21.837	25
NGJ	23.51	322.97	29.01	21.06

Accessible Data for Figure 2: Changes to the Workforce Size and Composition of the Joint-Air-to-Ground Missile Program from Fiscal Years 2013 through 2018

Career Field	2013	2014	2015	2016	2017	2018
Engineering and technical	13.999	17.25	17.08	15.83	25.5	40
Contracting, business, and support	10.583	18	25.58	25	29.5	15.5
Program management	9	12.5	15.66	19	15	16.5
Logistics	1	1	3	4	5	5

Accessible Data for Figure 3: Workforce Mix Varied for 11 Selected Major Defense Acquisition Programs GAO Reviewed

Program	Civilian	Military	Support Contractor	FFRDC
AMPV	137.75	8	8	0

Program	Civilian	Military	Support Contractor	FFRDC
PIM	124	4	15.75	0
JAGM	54.5	2	20.5	0
NGJ	243.04	1.4	152.11	0
Columbia	179.69	13	116.223	0
EPAWSS	20.6	5	12.2	0
JPALS	70.47	2.25	71.2	0
CIRCM	23	3	26.5	0
T-AO	17.7	0.5	39.6	0
DMS-M	7.2	1	21.25	0
MGUE	8	16.5	23.7	22

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