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March 2016

NAVY AND COAST GUARD SHIPBUILDING

Navy Should Reconsider Approach to Warranties for Correcting Construction Defects

GAO-16-71

GAO Highlights

Highlights of GAO-16-71, a report to congressional committees

March 2016

NAVY AND COAST GUARD SHIPBUILDING

Navy Should Reconsider Approach to Warranties for Correcting Construction Defects

Why GAO Did This Study

The U.S. government spends about $17 billion per year building ships to support national defense and homeland security. Defects often become evident shortly after a ship is delivered. Warranties and guarantees are both mechanisms to fix defects for which shipbuilders are responsible.

- Warranties give the government a contractual right to direct the correction of defects at the contractor's expense.
- Guarantees are Navy-specific contractual mechanisms that provide for the correction of defects; but unlike warranties are not covered in the FAR.

The House report accompanying the National Defense Authorization Act for Fiscal Year 2015 included a provision for GAO to review warranties and guarantees in government shipbuilding programs. This report assesses the extent to which (1) warranties and guarantees reduce the government's exposure to additional costs and risks of poor quality and (2) how the Navy and Coast Guard use acquisition regulations and guidance to implement warranties and guarantees. GAO reviewed the Navy's and Coast Guard's guaranty or warranty practices and policies and selected six case studies, comprised of four Navy ships—representing ships built in the last five years—and two vessels the Coast Guard most recently purchased.

What GAO Recommends

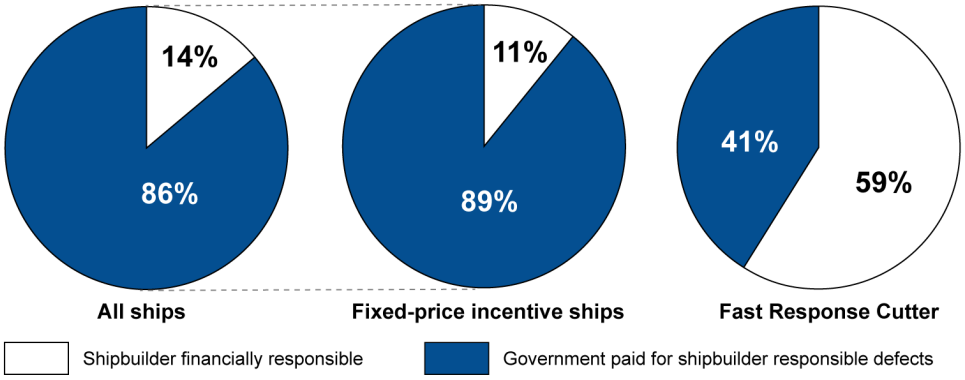
DOD with the Navy should take steps to structure contracts so shipbuilders cannot earn profit for correcting defects for which they are responsible; determine whether a warranty is appropriate; and establish a guaranty objective and guidance. DOD partially concurred with the recommendations and it plans to complete a study by September 2016.

View GAO-16-71. For more information, contact Michele Mackin at (202) 512-4841 or mackinm@gao.gov.

What GAO Found

For five of the six Navy and Coast Guard ships GAO reviewed, guarantees did not help improve cost or quality outcomes. While the type and terms of each contract determine financial responsibility for correcting defects, the government, in most of the cases GAO examined, paid shipbuilders to repair defects. For the four ships with fixed-price incentive type contracts and guarantee clauses, the government paid the shipbuilder 89 percent of the cost—including profit—to correct these problems. This means the Navy and Coast Guard paid the shipbuilder to build the ship as part of the construction contract, and then paid the same shipbuilder again to repair the ship when defects were discovered after delivery—essentially rewarding the shipbuilder for delivering a ship that needed additional work. Navy officials stated that this approach reduces the overall cost of purchasing ships; however, the Navy has no analysis that proves their point. In contrast, the warranty on another Coast Guard ship—the Fast Response Cutter (FRC)—improved cost and quality by requiring the shipbuilder to pay to repair defects. The Coast Guard paid upfront for the warranty, which amounted to 41 percent of the total defect correction costs. The figure below shows the amount, as a portion of the millions of dollars required to address defects, shipbuilders and the government paid to correct defects for the ships GAO reviewed and the difference in defect-correction arrangements.

Comparison of Costs Borne by Government and Shipbuilder for Correction of Shipbuilder-Responsible Defects for the Six Ships GAO Reviewed



Source: GAO analysis of Navy and Coast Guard data. | GAO-16-71

Although the Federal Acquisition Regulation (FAR) and the Department of Defense guidance instruct programs to, respectively, consider and document the use of a warranty, the use of warranties is not mandatory, and the Navy does not consider using them for ship contracts. In contrast, the Coast Guard's FRC warranty, as well as that planned for another upcoming ship class, fosters quality performance by following the FAR warranty provisions. The Navy may be missing opportunities for savings by not considering use of warranties. Further, the Navy has no stated objective for its guarantees, and guidance for contracting officers is minimal as to when or how to use a guaranty. While the FAR does not apply to guarantees, according to federal internal control standards, government programs require objectives and guidance to ensure that they achieve the desired results. Without a clear objective and guidance for using a guaranty and for determining when a warranty is appropriate in shipbuilding, Navy contracting officers do not have the information they need to make informed decisions regarding which mechanism is in the best interest of the taxpayer.

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March 3, 2016

Congressional Committees

The U.S. Navy and Coast Guard together spend approximately $17 billion per year building ships to provide the capabilities necessary to support our national defense and homeland security. Given the difficult operating environments and extended deployments for Navy and Coast Guard ships, it is essential that they operate as intended. In the past 10 years, several cases of poor quality in Navy shipbuilding programs focused attention on the construction quality of new ships. In many cases, deficiencies were attributable to problems with the basic elements of shipbuilding, such as welding, installing propulsion and other mechanical systems, and assembling the electrical systems. We have reported on cost and quality problems facing Navy and Coast Guard shipbuilding programs for many years. In May 2009, we compared Navy shipbuilding programs with those of commercial shipbuilders and buyers and found that the Navy accepts higher risks of quality expectations not being met than commercial buyers.[1] While Navy ships include complex and technically sophisticated systems, we noted, in November 2013, significant quality issues with the basic construction of some Navy ships. We found that some ship classes are routinely delivered with thousands of outstanding defects with the hull, mechanical, and electrical systems, and made recommendations aimed at improving the Navy's inspection process.[2] Further, we recently found that, in some cases, Coast Guard ships did not meet all key performance requirements due to shipbuilding deficiencies.[3] The Navy and Coast Guard have taken action on some, but not all of our recommendations.

Following ship delivery, Navy and Coast Guard ships undergo several activities to prepare them for service within the fleet. The process of

[1]GAO, *Best Practices: High Levels of Knowledge at Key Points Differentiate Commercial Shipbuilding from Navy Shipbuilding,* GAO-09-322 (Washington, D.C.: May 13, 2009).

[2]GAO, *Navy Shipbuilding: Opportunities Exist to Improve Practices Affecting Quality,* GAO-14-122 (Washington, D.C.: November 19, 2013).

[3]GAO, *Coast Guard Acquisitions: Better Information on Performance and Funding Needed to Address Shortfalls,* GAO-14-450 (Washington, D.C.: June 5, 2014).

preparing ships for operations often includes a specified period of time in which the shipbuilder retains responsibility for correcting construction defects that arise on the ship after delivery—known as a warranty or guaranty period. Warranties and guarantees are contractual arrangements made with the shipbuilder regarding the correction of deficiencies discovered during this period, which generally lasts 8 to 12 months after delivery for Navy and Coast Guard ships. The House Report 113-446 on the National Defense Authorization Act for Fiscal Year 2015 included a provision that GAO review warranties and guarantees in government shipbuilding programs and how these mechanisms compare with commercial shipbuilding.[4] This report assesses: (1) the extent to which the Navy and Coast Guard's guaranty or warranty mechanisms reduce the government's exposure to additional costs and improve the quality of basic ship construction, if any, as compared to commercial shipbuilding; and (2) the extent to which the Navy and Coast Guard use available acquisition regulation and guidance in implementing warranties and guarantees in shipbuilding programs.

To determine whether guaranty or warranty mechanisms reduce the government's exposure to additional costs and improve the quality of these ships, we reviewed the Navy and Coast Guard's guaranty and warranty policies and procedures. To further our understanding of these policies and procedures, we reviewed six case study ships that encompassed the majority of all ship classes recently built by the Navy and Coast Guard. Selected ships were delivered in the last 5 years. Most of the contracts for the ships we reviewed were also used to purchase other ships in the class. While we focused on six case studies, the contracts and guaranty clauses we reviewed covered more than 20 ships. Further, based on our analyses and our discussions with Navy contracting officials, we believe our review is illustrative of Navy shipbuilding in general because every Navy shipbuilding contract uses a similar guaranty clause. The six ships in our scope are shown in table 1; our scope includes most of the major Navy and Coast Guard shipyards.

[4] H.R. Rep. No. 113-446, at 31 (2014).

Table 1: Navy and Coast Guard Ships and Associated Shipyards Included in This Review

Shipyard	Location	Ship class (Ship)
Austal USA (subcontractor to General Dynamics/Bath Iron Works)	Mobile, Alabama	Littoral Combat Ship (LCS 4)
General Dynamics/Bath Iron Works	Bath, Maine	Arleigh Burke Class Guided Missile Destroyers (DDG 112)
Bollinger Shipyards	Lockport, Louisiana	Fast Response Cutter (FRC 6)
Huntington Ingalls Industries Shipbuilding	Pascagoula, Mississippi	National Security Cutter (NSC 4)
Huntington Ingalls Industries Shipbuilding	Avondale, Louisiana	San Antonio Class Amphibious Transport Dock (LPD 25)
Marinette Marine Corporation (subcontractor to Lockheed Martin)	Marinette, Wisconsin	Littoral Combat Ship (LCS 3)

Source: GAO. | GAO-16-71

We did not choose lead ships, because lead ships tend to be purchased using cost-reimbursement type contracts and usually have more and different quality issues than the rest of the class. For each ship, we reviewed the guaranty or warranty contract language and other relevant clauses. We interviewed officials from the Navy and Coast Guard to gain an understanding of the guaranty or warranty process and compared our observations to the Federal Acquisition Regulation (FAR), Department of Defense, and Department of Homeland Security guidance on guaranties or warranties. We also compared ships with guarantees to government and commercial ships with warranties to determine the extent to which each mechanism improves ship quality. During visits to the shipyards, we met officials from Navy and Coast Guard offices, such as the Navy Supervisor of Shipbuilding, Conversion and Repair, Program Executive Offices, and Coast Guard's Project Residence Offices. We also met with Coast Guard contracting officials and contracting officers with the Naval Sea Systems Command Contracting Directorate. These interviews provided information on how the Navy and Coast Guard use and implement warranties and guarantees on newly constructed vessels. We also selected leading commercial buyers in the cruise, oil and gas, and commercial shipping industries based on our previous work on shipbuilding best practices and conducted interviews with them regarding how they contract for and execute warranties on ships of similar size and construction complexity as Navy and Coast Guard ships.[5] Our

[5] GAO-09-322 and GAO-14-122.

comparisons with commercial shipbuilding focused on basic ship construction because the work is similar to hull, mechanical and electrical work completed on Navy and Coast Guard ships. Appendix I contains more detail on our objectives, scope, and methodology.

We conducted this performance audit from December 2014 to March 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence 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

Warranty and Guaranty Mechanisms in Navy and Coast Guard Shipbuilding

Acquiring a ship is a complex task and it is expected that, to a certain degree, parts will break or welds may fail after a ship is delivered. Defects related to the welding, fabrication, electrical, piping, and propulsion systems on the ship that are the result of construction issues are typically the shipbuilder's responsibility to fix as opposed to problems with systems, such as weapon or complex information technology systems, which are purchased separately and, often, are the government's responsibility to correct. Warranties and guarantees are both mechanisms to address the correction of shipbuilder-responsible defects, but they differ in key ways.[6] Warranty provisions are outlined in the FAR, while the Navy sets forth its own guaranty provisions. In the case of the Coast Guard's NSC, program officials told us they adopted the Navy's guaranty provisions; therefore we refer to the guaranty in this report as "the Navy's guaranty" even though it also pertains to the NSC. Shipbuilding contracts

[6] This report defines shipbuilder-responsible deficiencies as defects that occurred between ship delivery and final contract trials relating to aspects of the ship that the shipbuilder was responsible for delivering in satisfactory condition. Shipbuilder-responsible deficiencies do not refer to financial responsibility for the costs of correction. The shipbuilder may not be contractually obligated to fix all of the shipbuilder-responsible defects, depending upon the contract terms. Defects discovered during ship construction--prior to delivery--are not included in this report but are addressed in our prior work; see GAO-14-122 and *GAO*, *Littoral Combat Ship: Navy Complied with Regulations in Accepting Two Lead Ships, but Quality Problems Persisted After Delivery,* GAO-14-827 (Washington, D.C.: Sept. 2014).

can either use a warranty, a guaranty, or have no mechanism to address defects after delivery. Table 2 shows key elements of warranties and guarantees.

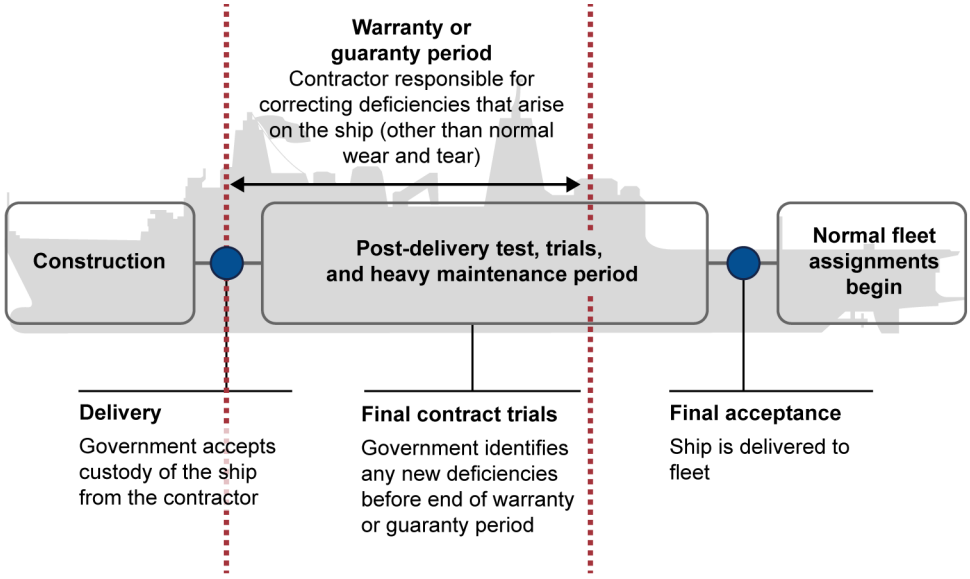
Table 2: Comparison of Warranty and Guaranty Provisions in Navy and Coast Guard Shipbuilding

	Warranty	Guaranty
Description	Used to correct shipbuilder-responsible defects after delivery, usually at the shipbuilder's expense.	Used to correct shipbuilder-responsible defects after delivery, but the responsibility for paying for these corrections varies upon contract terms.
Length	Warranties are limited to a specific period of time—typically 12 months.	Guarantees are limited to a specific period of time, which generally ranges from 8 to 12 months.
Liability limitations	Typically there are no cost limits on the shipbuilder's financial responsibility for correcting defect claims.	Uses a limitation of liability: the Navy includes a clause in its shipbuilding contracts that provides for the shipbuilder to be responsible for *performing* work to correct defects during the guaranty period up to a certain dollar threshold, but the shipbuilder is not necessarily *financially* responsible for costs associated with the work. Once this threshold is reached, the shipbuilder is no longer contractually obligated to perform additional work to correct any additional defects, even if the ship is still within the guaranty period.
Regulation and guidance	Federal Acquisition Regulation (FAR) subpart 46.7 applies to warranties and provides the government with a contractual right for the correction of defects, at the contractor's expense, notwithstanding other requirements of the contract regarding inspection and acceptance. The use of warranties is not mandatory and the FAR provides that the benefits of a warranty must be commensurate with the costs of the warranty to the government. The FAR also prescribes specific warranty contract clauses when use of a warranty is appropriate that delineate the warranty period; the contractor's warranty that supplies under the contract will be free from defects; and the government's remedies, including the right to require the contractor to repair defects.	As guarantees are a Navy-specific contracting mechanism, the FAR does not apply. Navy ships typically use standard Navy-specific contract clauses to comprise the guaranty mechanism including: (1) provisions in the inspection clause that, among other things, provide the government with the right to direct correction of contractor-responsible defects discovered during the guaranty period; (2) a guaranty clause that specifies the length of the guaranty period and that the shipbuilder can provide a representative (engineer) on board the vessel; and (3) a limitation of contractor's liability for the correction of defects as described above.

Source: GAO analysis of the FAR, and Navy and Coast Guard data. | GAO-16-71

In Navy and Coast Guard shipbuilding, the warranty or guaranty period does not overlap with ship deployments but typically occurs while the crew is conducting tests and trials, and also performing any additional construction (such as modifications), among other activities. Generally, the warranty or guaranty concludes with a ship's final contract trials. Figure 1 highlights where the warranty or guaranty period resides in the typical Navy and Coast Guard shipbuilding process.

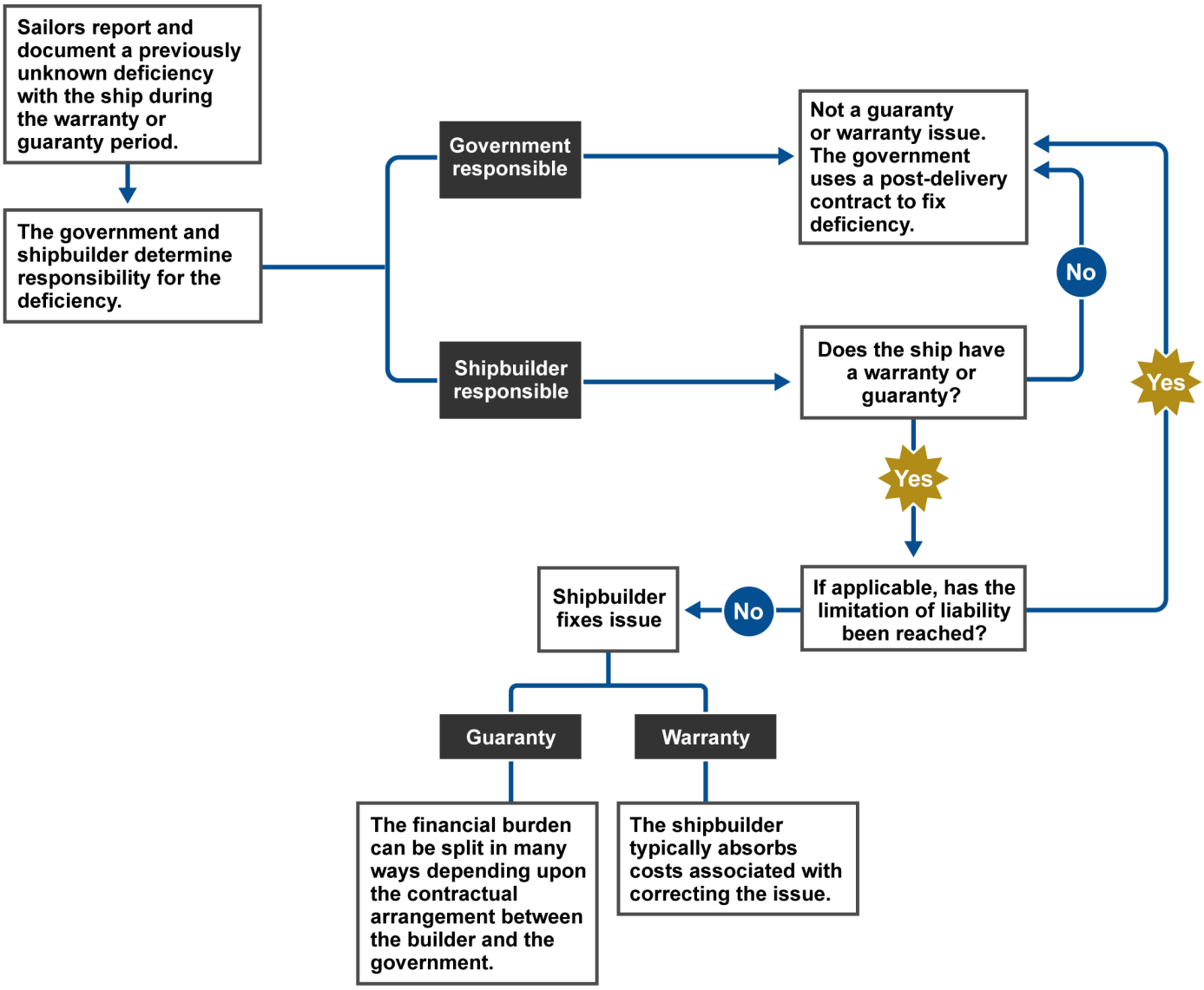
Figure 1: Warranty or Guaranty Period in Terms of Navy and Coast Guard Shipbuilding Process



Source: GAO analysis of Navy and Coast Guard data. | GAO-16-71

While there are some nuances, the basic process of adjudicating a warranty or guaranty claim is the same for Navy and Coast Guard programs. Figure 2 illustrates this process from the beginning—when a sailor identifies a problem—through the end when the government utilizes the warranty or guaranty to fix the defect.

Figure 2: Navy and Coast Guard Warranty or Guaranty Process



Source: GAO analysis of Navy and Coast Guard data. | GAO-16-71

While the focus of this report is on warranties and guarantees, these are not the only mechanisms intended to address shipbuilder-responsible defects after delivery. In some cases, the Navy and Coast Guard insert a latent defect contract clause that provides for the correction of deficiencies that could not be discovered through reasonable inspection when the ship was delivered. At final acceptance, prior to delivery to the

fleet, the Navy and Coast Guard acknowledge that the ship conforms to all quality requirements, with the exception of latent defects, fraud, or gross mistakes amounting to fraud. Further, there is also a separate process for deficiencies pertaining to fraudulent work or parts, such as counterfeit parts.

Contract Types Used to Purchase Navy and Coast Guard Ships

The Navy and Coast Guard use three primary contract types when purchasing ships—fixed-price type, incentive type, and cost-reimbursement type contracts. The first ships of a class, called lead ships, are often purchased with cost-reimbursement type contracts under which the government generally bears the risk of cost, schedule, or ship performance problems. After the first few ships in a class, the Navy and Coast Guard generally use firm fixed-priced or fixed-price incentive contracts because, as more ships are built, there is greater certainty about costs and performance.

The following is a brief description of each contract type used to construct and repair the Navy and Coast Guard ships we reviewed:

- **Firm Fixed-Price Contract**—The government agrees to purchase a ship for a set price. The shipbuilder bears the full responsibility for increases in the cost of construction and earns a larger profit if actual costs are below the contract price. When using this contract type, the cost of the warranty or guaranty can be included in the construction price of the vessel or priced separately for an agreed-upon amount. In the government, this contract type is usually used for mature shipbuilding efforts because it works best when the ship buyer and shipbuilder are confident in the cost of ship construction.

- **Fixed-Price with Economic Price Adjustment (EPA) Contract**—Similar to a firm fixed-price contract, the government and the shipbuilder agree to a set price for the ship, but in a fixed-price EPA contract the government and shipbuilder agree to adjust, upward or downward, the stated contract price upon occurrence of specified contingencies, such as changes in costs of labor or material that the shipbuilder experiences during contract performance. For example, changes to the price of steel could be accounted for using this contract type.

- **Fixed-Price Incentive Contract**—Under fixed-price incentive contracts, the government and the shipbuilder agree upon a target cost, target profit, ceiling price, and a profit adjustment formula

referred to as a share line. The government and the shipbuilder share, in accordance with the share line, responsibility for cost increases or decreases compared to the target cost, up to the ceiling price at which point the shipbuilder is responsible for all remaining costs. Generally, the share line functions to decrease the shipbuilder's profit as its actual costs exceed the target cost. Likewise, the shipbuilder's profit increases when actual costs are less than the target cost for the ship. In an illustrative example, typical of ships in our review, if a contract has a 70/30 share line and the shipbuilder's actual costs were over the target cost by $1 million; the government would pay 70 percent ($700,000) of the additional costs needed to complete the ship and the shipbuilder would absorb 30 percent of the cost overrun ($300,000) as a reduction to profit.

- **Cost-reimbursement Contract**—Cost-reimbursement type contracts provide for the government to pay the shipbuilder's costs to the extent specified in the contract and may include an additional fee (profit). As opposed to a fixed price type contract that requires the shipbuilder to deliver a ship for the price specified in the contract, under a cost-reimbursement type contract the shipbuilder agrees to use its best efforts to perform the work within the estimated costs. But the government must reimburse the builder for its allowable costs regardless of whether the work is complete. These contracts can also include a guaranty clause.[7] In the case of the Coast Guard's NSC, the first three ships were built using cost-reimbursement type contracts while the remaining five are being built with fixed-price incentive contracts. After ship delivery, the Navy may award separate cost-reimbursement type contracts to complete post-delivery activities, such as installing weapon systems and repairing defects.

Table 3 shows the contract and vessel type for each Navy and Coast Guard ship we reviewed. As discussed earlier, we selected ships that were constructed after at least one other ship in the class.

[7] We recently discussed the guaranty period on lead ships with regard to LCS 1 and 2, which were constructed under cost-reimbursement type contracts. See GAO-14-827.

Table 3: Cost and Contract Characteristics of Navy and Coast Guard Ships In Our Review

	Navy				Coast Guard	
Vessel name	**DDG 112**	**LPD 25**	**Littoral Combat Ship 3**	**Littoral Combat Ship 4**	**National Security Cutter 4**	**Fast Response Cutter 6**
Target price (in millions)[a]	$602	$1,213	$383	$357	$480	$39
Construction contract type	Firm fixed price	Fixed price incentive	Fixed price incentive	Fixed price incentive	Fixed price incentive	Fixed price with economic price adjustment
Warranty or guaranty	Guaranty	Guaranty	Guaranty	Guaranty	Guaranty[b]	Warranty

Source: Department of Defense and Department of Homeland Security Documentation. | GAO-16-71

[a]Target price represents the target cost plus the target profit or, in the case of ships with non-fixed-price incentive type contracts, the price agreed to in the contract.

[b]Given that the characteristics of the warranty function more like the Navy's guaranty, we refer to the NSC's mechanism as a guaranty, rather than a warranty.

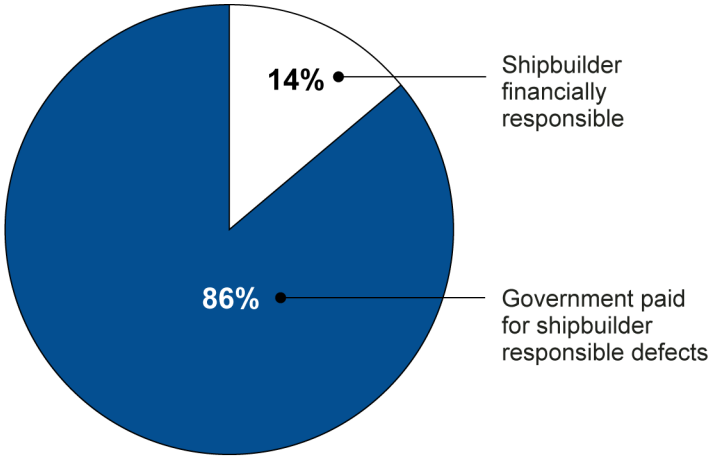
Navy's Guaranty Mechanism Generally Has No Effect on Improving Cost and Quality Outcomes, in Contrast to FRC and Commercial Warranties

The Navy and Coast Guard paid shipbuilders to repair shipbuilder-responsible deficiencies after delivery for most of the ships that we reviewed. In the four case study ships that used a fixed-price incentive contract with a guaranty, the Navy and Coast Guard paid the shipbuilder to build the ship as part of the construction process, and then paid the same shipbuilder a second time to repair the ship when defects were discovered after delivery. Navy contracting officials stated that the Navy accepts the costs of fixing deficiencies to lower the overall purchase price of its ships. However, this contracting approach results in the shipbuilder profiting from fixing deficiencies on a ship that it was initially responsible for delivering to the government in a satisfactory condition. In contrast, commercial ship buyers and the Coast Guard—in the case of the FRC—used warranties combined with firm fixed-price or fixed-price with EPA contracts, respectively, to lower the ultimate cost of the ship while also improving the ship's quality. The Coast Guard's experience with the FRC is akin to outcomes on large commercial ships. Buyers of these ships told us that they include a warranty that holds the shipbuilder financially responsible for correcting deficiencies following delivery and improves ship quality through a variety of strategies.

Contract Type and Terms Dictate the Degree to Which the Government Pays for Defects after Delivery

For the six government ships we reviewed, the type of contract and terms used to purchase the ship determined the degree to which the government or the shipbuilder paid for shipbuilder-responsible deficiencies after delivery. Figure 3 shows the percentage of shipbuilder-responsible defects that the government paid to correct, compared to those absorbed by the shipbuilder.

Figure 3: Comparison of Costs Borne by Government and Shipbuilder for Correction of Shipbuilder-Responsible Defects for the 6 Ships in GAO's Review



Source: GAO analysis of Navy and Coast Guard data. | GAO-16-71

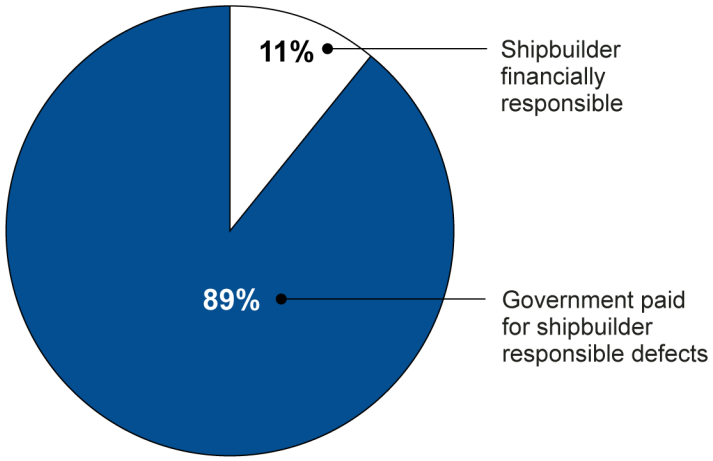
Note: Appendix I contains more information about our calculations.

As shown in figure 3, the government paid 86 percent of the costs associated with fixing defects that were attributed to the shipbuilder for all of the ships in our review, which we calculated as $6.4 million based on available information. However, the full extent of what the government paid to correct shipbuilder-responsible defects across all of our case study ships is not known because the data did not identify whether or not the shipbuilder or the government was responsible for each defect. These data issues are addressed below, and appendix I contains more detail. Also, as discussed below, the breakdown of who pays for shipbuilder-responsible defects is different depending on the contract type and terms for the ships.

Under Fixed-Price Incentive Contracts, Government Pays Additional Costs and Shipbuilders Earn Profit to Correct Defects

For the four fixed-price incentive contracts in our review, the government paid for almost all shipbuilder-responsible deficiencies found after delivery. For example, on LPD 25, the ship's exterior hull paint began to peel shortly after delivery. The Navy determined that the shipbuilder did not adequately prepare the surface of the ship prior to applying a second coat of paint and submitted the issue as a guaranty claim. The Navy docked the ship and the shipbuilder re-painted the vessel. The shipbuilder submitted invoices for the work completed and the Navy paid the shipbuilder $315,000—even though the shipbuilder was responsible for the failure. This example illustrates how a guaranty functions with a fixed-price incentive contract type, which results in the government paying the costs to correct problems. As shown in figure 4 the government paid for 89 percent of the costs to correct shipbuilder-responsible defects for the ships in our review that had fixed-price incentive contracts, which we calculated as $4.9 million based on available information. As noted above, however, this figure does not include all shipbuilder-responsible defects for these four ships due to the data issues we discuss in the report.

Figure 4: Comparison of Costs Borne by Government and Shipbuilder for Correction of Shipbuilder-Responsible Defects for Four Ships with Fixed-Price Incentive Type Contracts



Source: GAO analysis of Navy and Coast Guard data. | GAO-16-71

Note: The ships are LPD 25, Littoral Combat Ships 3 and 4, and the National Security Cutter 4. Appendix I contains more information about our calculations.

For the fixed-price incentive contracts in our review, the government's share of the costs to correct shipbuilder-responsible defects is determined by

1. the share line up to the contractor's limitation of liability; or
2. in the case of NSC 4, a separate cost-reimbursement type line item in the construction contract not subject to the share line calculation; and, in many cases,
3. follow-on contracts, or modification to existing contracts, to pay for remaining shipbuilder-responsible deficiencies once the limitation of liability was reached.

We elaborate on these three scenarios and how they impact the guaranty calculations for each ship below.

The share line determines the government's costs up to the contractor's limitation of liability:

For two of the three Navy ships in our review with fixed price incentive contracts, the Navy paid for the guaranty work up to the contractor's limitation of liability for correction of defects—which was initially $1 million or less for all of the Navy ships with fixed-price incentive contracts in our review. A key point is that, for these ships, the government's share of the payments for the correction of shipbuilder-responsible defects depends upon the overall cost performance of the shipbuilder. While the specific share line calculations differ by ship, for Navy ships with fixed-price incentive contracts, guaranty costs, up to the limitation of liability, are included in the overall target cost of the ship. As such, when actual construction costs are above the target costs, the actual price of the ship to the government increases and the shipbuilder's profit decreases according to an agreed upon percentage determined by the share line. This means that the government pays additional costs for every dollar over the target cost and, likewise, the shipbuilder absorbs its share of the cost overrun through a reduction in its target profit. In the case of LPD 25 for example, the contract initially included $1 million of guaranty work (the limitation of liability). Actual costs for LPD 25 construction exceeded the target cost by 32 percent, which, according to the share line, reduced the shipbuilder's profit by 12 percent for the whole ship (including the guaranty work). This means that for the guaranty work up to the initial $1 million limitation of liability, the shipbuilder lost $120,000 in profit and the government paid $880,000 of the first $1 million of shipbuilder-responsible defects discovered after delivery. If

actual costs for the ship were lower than the target cost, the opposite scenario would occur—meaning the shipbuilder would earn additional profit for correcting errors determined to be its responsibility.

A separate cost-reimbursement type line item in the construction contract not subject to the share line calculation determines the government's costs:

In the case of the NSC 4, a separate cost-reimbursement type line item in the construction contract determined the Coast Guard's share of the guaranty costs for NSC 4. Unlike the Navy's approach, the Coast Guard's guaranty on NSC 4 was purchased as a separate cost-reimbursement type line item in the construction contract and thus was not subject to the share line calculation. Using this method, the Coast Guard paid the shipbuilder $588,000 to fix claims under the guaranty, which included a fixed-fee (profit) amount. However, contracting for deficiency-correction on a separate line item allowed the Coast Guard to track deficiency claims and payments by specifically denoting it as guaranty work, a practice that could increase the data available to improve agency assessments about shipbuilder-responsible defects. According to Navy contracting officials, the Navy has not considered the pros and cons of reflecting guaranty work as a separate line item in shipbuilding contracts—potentially missing an opportunity to improve incentives and increase transparency.

Follow-on contracts, or modification to existing contracts, to pay for remaining shipbuilder-responsible deficiencies once the limitation of liability was reached:

For the three Navy ships with fixed-price incentive contracts in our review, costs associated with shipbuilder-responsible deficiencies exceeded the initial limitation of contractor's liability. Navy officials told us, in most cases, they do not increase the limitation of contractor's liability under construction contracts to cover shipbuilder-responsible defects because it is generally more expensive—due to the share line arrangement—than paying the shipbuilder to correct deficiencies under a separate contract. In general, to pay for the remaining shipbuilder-responsible deficiencies beyond the contractor's limitation of liability, the Navy awards follow on contracts to the shipbuilders. Navy officials stated that these follow-on contracts could be used exclusively to pay for correcting the deficiencies, but—with respect to LCS 3 and 4—these contracts were also used for other purposes. In the case of NSC 4, the government did not reach the $1 million

shipbuilder's limitation of liability primarily because the Coast Guard chose to use other contracting mechanisms to address a majority of shipbuilder-responsible defects.

For each case study ship with a fixed-price incentive contract, we determined the total amount the government had to pay to correct shipbuilder-responsible defects:

- **LPD 25**—The shipbuilder exceeded the ceiling price of the vessel, making it responsible for all additional costs to complete the ship after that point. Under the contract, the contractor's limitation of liability for correction of defects was initially $1 million, but the government found $4.8 million in deficiencies. The Navy modified the contract to increase the contractor's limitation of liability to $4.8 million to cover the costs for correcting all shipbuilder-responsible deficiencies. In increasing the contractor's limitation of liability, the Navy also increased the contract's target cost and ceiling by $3.8 million each, since $1 million was included in the initial target cost. In addition, the Navy increased the contractor's target profit. These changes resulted in a slight improvement in the shipbuilder's cost performance and reduced the amount of profit that the shipbuilder lost. While the shipbuilder earned less profit than it would have earned had the ship been delivered at its target cost, it still earned some profit. Based on our analysis of the final cost of the ship and how the share line applied to the guaranty work, we found that the shipbuilder was responsible for $578,000 of the $4.8 million in guaranty claims under the construction contract.

- **LCS 3 and 4**—According to Navy contracting officers, the Navy negotiated lower construction costs for these vessels by reducing the limitation of contractor liability associated with the guaranty from $1 million to $100,000 and $0, respectively. Given the low or non-existent limitation of contractor's liability for guaranty work, the Navy paid for almost all of the shipbuilder-responsible deficiencies discovered after delivery using cost-reimbursable orders under basic ordering agreements.[8] However, these agreements were used for many purposes, including correcting defects on the installation of

[8]A basic ordering agreement is a written instrument of understanding between an agency and contractor that contains, among other things, terms and clauses applying to future contracts (orders) between the parties. FAR § 16.703.

government purchased systems and completion of construction work. The Navy does not separately track guaranty work when using these basic ordering agreements. As a result, we could not determine the total amount of claims that were the result of shipbuilder-responsible defects. For LCS 3 and LCS 4, the Navy spent $46 million and $77 million, respectively, under these post-delivery agreements to correct defects, complete ship construction, and assist with tests and trials, among other tasks.

- **NSC 4**—Because the guaranty on NSC 4 is a separately priced cost-reimbursement type contract line item from the construction line, it was not subject to the construction share line. The guaranty line item provides for the Coast Guard to pay for guaranty claims on a cost-reimbursable basis, up to the contractor's limitation of liability for correction of defects, which was $1 million. In addition to the $588,000 paid by the Coast Guard under the guaranty, Coast Guard program officials also told us that a majority of the shipbuilder-responsible defects were corrected through other contracting mechanisms or Coast Guard units, particularly if these solutions were less expensive. However, the Coast Guard does not track the costs associated with the shipbuilder-responsible defects paid through these other means.

Although the Navy uses profit or fee as an incentive to encourage cost efficiency, the Navy's guaranty, when used with a fixed-price incentive construction contract, results in the shipbuilder earning profit or fee from correcting its own mistakes. For ships with fixed-price incentive contracts, we found that, included in the costs the government paid to correct shipbuilder-responsible defects, the shipbuilders earned between 1 and 10 percent profit or fee under the construction contract or under a follow-on arrangement to correct the defects determined to be their responsibility for both guaranty claims and follow-on work to correct the defects. Shipbuilders earn profit under the construction contract, and also earn a fee (profit) to correct remaining deficiencies under any applicable follow-on arrangement.

According to the FAR, incentives should motivate contractor efforts towards efficiency and improve contractor cost performance. Navy contracting officials stated that shifting additional cost burden or reducing the shipbuilder's profit for correcting defects will result in more expensive ships, as the shipbuilder will shift this additional risk into higher target costs for the ships. However, the Navy has not assessed different methods to change the terms of the guaranty in the contract with regards to paying for deficiencies. For example, it has not assessed the pros and

cons of structuring contracts to prevent shipbuilders from earning profit from guaranty work; breaking the guaranty out as a separate line item not subject to the share line, or revisiting the limitations of liability amounts. Without reassessing its practice of allowing the shipbuilder to earn profit for correcting shipbuilder-responsible defects, the Navy may be missing opportunities to improve incentives and lower costs to the taxpayer.

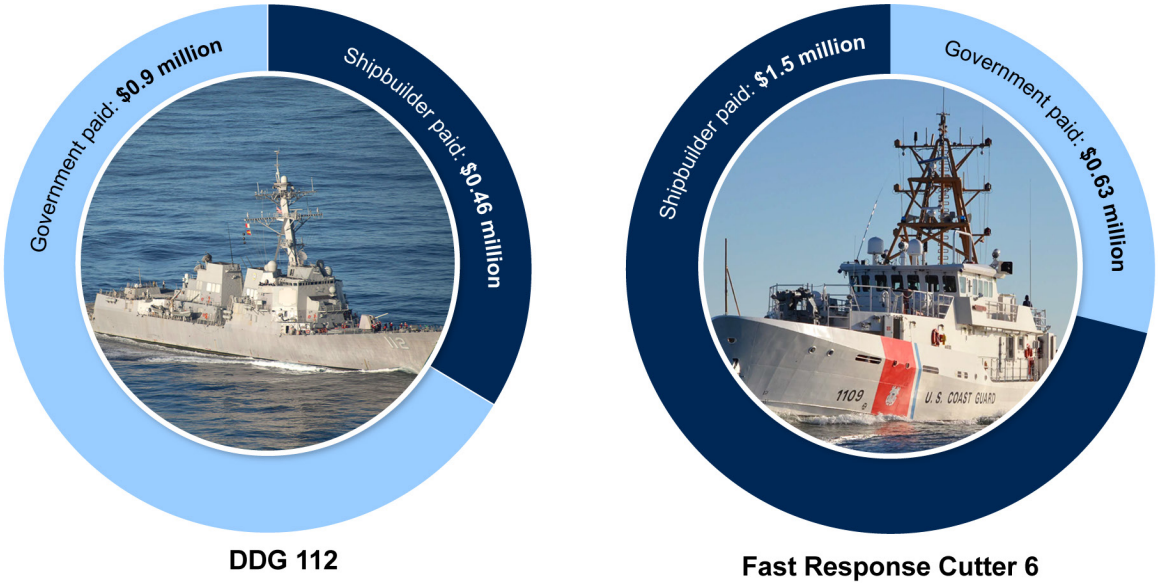
Under Other Fixed-Price Contracts, Shipbuilder Pays to Correct Defects, but Value of Guaranty or Warranty Depends on Contract Terms

For the two ships we reviewed that used a firm fixed-price and fixed-price with EPA contract, the shipbuilder, rather than the government, paid for shipbuilder-responsible deficiencies after delivery, but the value of the warranty or guaranty was different for each ship. The Coast Guard paid $629,315 at contract award for the warranty on the Coast Guard's sixth FRC. Under the terms of the warranty, the Coast Guard could require the shipbuilder to repair an unlimited amount of shipbuilder-responsible defects within the first year after delivery, and the shipbuilder was responsible for all costs to do so. To date, the Coast Guard has claimed over $1.5 million worth of repairs under the warranty for the ship. Thus, the warranty provided a 145 percent return on investment.

In the case of the DDG 112, the Navy included a guaranty with a $5 million limitation of liability. The DDG 112 contract was originally fixed-price incentive but was later modified to a firm fixed-price contract. As a result of this modification, the Navy did not change the guaranty terms or limitation of liability amount, but the modification of the contract type altered responsibility for paying for guaranty work. Instead of the Navy paying the shipbuilder its costs (which could include profit) subject to the share line—as would have been done under the fixed-price incentive contract type—the shipbuilder now had to absorb the costs for the correction of up to $5 million in deficiencies. However, the Navy made a total of $459,000 in guaranty claims by the time the guaranty period expired, but paid the shipbuilder approximately $902,000—principally for the services of a shipbuilder guaranty engineer who rode with the ship's crew for the 12 month guaranty period—to administer the guaranty. According to Navy program officials, the guaranty engineer, who works for the shipbuilder, provides value by scheduling repair, maintenance, and upgrade work and lowering guaranty claims since he or she works with the ship's crew to correct problems as they occur without filing a formal claim. Nevertheless, taking into account the cost to administer the guaranty, it cost the government $443,000 ($902,000 paid for the guaranty engineer minus the $459,000 in claims). As a result, DDG 112's

guaranty resulted in a lower value than FRC 6's warranty, particularly since the shipbuilder's personnel to administer the warranty on the FRC are provided at no additional cost to the government.[9] Figure 5 illustrates the costs borne by the government and shipbuilder to correct shipbuilder-responsible defects on the FRC 6 and the DDG 112 after delivery.

Figure 5: Costs Borne by Government and Shipbuilder to Correct Defects on the Fast Response Cutter 6 and DDG 112



Source: GAO analysis of Navy and Coast Guard data. | GAO-16-71

Unlike Navy Guarantees, Warranties Used in Commercial Shipbuilding and FRC Program Improve Ship Quality Outcomes

Commercial ship buyers and the Coast Guard, in the case of the FRC, demonstrate that warranties can be valuable in shipbuilding because they save the ship buyer money and improve the quality of the vessel. Commercial ship buyers and Coast Guard officials stated that warranties foster quality performance because the shipbuilder's profit erodes as it spends money to correct deficiencies after delivery, during the warranty period. In assessing commercial and Coast Guard warranties in contrast with the Navy's guaranty terms for the ships we reviewed, we found that for ships with warranties: (1) the shipbuilder corrected more deficiencies,

[9]As we discuss below, our prior work has shown that Navy ships—including DDG 112—are delivered to the government with numerous defects. GAO-14-122

(2) the value of the warranty was increased through extensions, (3) the government incentivized better terms from shipbuilder suppliers and class quality improvements and (4) a warranty engineer who worked for the ship buyer helped improve quality outcomes.

Robust Defect Correction

In general, commercial buyers, as well as the Coast Guard for the FRC, submitted more claims for correcting defects than the Navy did for its ships with guarantees. On average, commercial ship buyers told us that the number of warranty claims totals 1 to 2 percent of the construction value of the ship, but can range as high as 3 to 4 percent if key systems experience failures during the warranty period. For example, one commercial ship buyer had to take a ship out of operation for 2 months due to engine failures, which were repaired at the shipbuilder's expense. Commercial ship buyers told us that even well-built and mature ships generally have claims totaling at least 1 percent of the cost of construction. For FRC 6, the Coast Guard's program office estimates that the shipbuilder will pay about 4 percent of the construction cost of the ship to fix deficiencies.

In comparison, the Navy has typically claimed significantly fewer construction defects on its ships following delivery. Based on our prior work, this situation is not because the Navy's ships had fewer defects, as Navy ships are delivered to the government with numerous defects that must be corrected later.[10] For the two Navy ships we reviewed that tracked guaranty claims (LPD 25 and DDG 112), the Navy, on average, made guaranty claims totaling less than one-tenth of a percent of the construction cost of the ship. For example, on DDG 112, the Navy submitted claims equal to 0.08 percent of the ship's $602 million construction cost. Navy officials attribute the DDG 112's low number of claims to its well understood design and construction because the shipbuilder has delivered 34 ships. In November 2013, we found that commercial ship buyers have more effective inspection practices than the Navy to discover and resolve quality issues prior to delivery.[11] In addition, commercial buyers told us that even the most mature and well-built ships typically experience shipbuilder-responsible deficiencies after delivery that total about one percent of the vessel's cost—more than 10 times as many deficiencies as were discovered and attributable to the shipbuilder

[10]GAO-14-122.

[11]GAO-14-122.

on the DDG 112. The Navy had a similar low level of claims on LPD 25—equaling about one-third of one percent of the ship's construction cost—a ship that had fewer predecessor ships, a history of quality problems, and exceeded its ceiling cost, which we discussed in our November 2013 report.[12] Since the Navy pays the shipbuilder to correct deficiencies regardless of responsibility, there is less incentive than in commercial shipbuilding or the FRC program to discover every deficiency during the guaranty period.

Further, the Navy may not file a guaranty claim for every shipbuilder-responsible issue if it decides that another contract mechanism is better suited to address the problem. According to several Navy and Coast Guard officials, the government does not always submit a guaranty claim to correct shipbuilder-responsible deficiencies, particularly in cases where a correction is not needed immediately or can be accomplished using a less expensive contracting arrangement. For example, according to these officials, if the fleet that maintains in-service ships has a contract in place that can purchase needed parts and services more cheaply, then the Navy or Coast Guard will likely use that contract instead of the guaranty. In these cases, the deficiency would not be documented as a guaranty or shipbuilder-responsible defect. We plan to examine the Navy's defect correction process as a part of future work focused on the Navy's shipbuilding practices after ship delivery.

Extended Warranty Period for Repaired Defects

Another critical aspect of commercial ship and Coast Guard warranties is that they contain provisions to extend warranties on parts replaced during the warranty period. On the FRC 6, the shipbuilder replaced a water heater 9 months into the 12-month warranty period, and the warranty period for the water heater was subsequently extended for an additional 12 months. Commercial companies extend the warranty on parts that break during the warranty period as well, in some cases capping the extensions at either 24 or 36 months. For most Navy ships, extending the guaranty would not provide additional coverage since the Navy, under a fixed-price incentive arrangement, would also pay for any defects found during the extension period. This is because the Navy's practice for its fixed-price incentive contracts is to include the guaranty as part of the overall negotiated target cost for construction of the ship subject to the

[12]GAO-14-122.

share line. Thus, an extended guaranty period would not decrease the Navy's financial liability.

Better Terms with Suppliers and Class-wide Quality Improvements

In the case of the Coast Guard's FRC warranty, shipbuilder representatives told us the terms force them to ensure that they receive the same warranty terms from their suppliers. This arrangement, in turn, can result in a better value for the government. Due to the length of time required to build a ship, supplies are no longer covered under their original warranties because parts are often purchased and installed a year or more before the ship is delivered to the government. To address this issue, shipbuilder representatives stated that they actively seek supplier warranties that mirror the Coast Guard's terms and conditions to share the potential costs associated with the warranty. For FRC 6, the subcontractors are to conduct repairs accounting for about 40 percent of the warranty work, while the shipbuilder is responsible for the remaining warranty work. As an example of how this can benefit the government and the shipbuilder, on two earlier ships of the class—FRC 2 and 3—the Coast Guard submitted over $10 million worth of warranty claims. According to FRC program officials, these claims were primarily engine problems that were paid for by the engine supplier. As it turned out, these engine issues comprised more than 90 percent of the total amount of warranty claims on these ships.

Likewise, a commercial ship buyer told us that their company prefers supplier warranties on key parts that extend beyond the shipbuilder's warranty on the full vessel and work to negotiate these terms directly with the original equipment manufacturers. Thus, a significant portion of the claims have not fallen solely on the shipbuilder to fix, demonstrating how a warranty can provide value without unduly harming the shipbuilder's profits. For instance, the shipbuilder is incentivized to negotiate extended warranties with its suppliers that match the duration of the warranty on the whole ship. However, for the Navy ships we reviewed, the shipbuilders do not have this same incentive since the Navy absorbs the risk of paying for defects.[13]

[13] As noted above, in late 2011, the DDG 112 contract which was originally fixed-price incentive was modified to a firm fixed-price contract. At the time, DDG 112 was already under construction; therefore, the shipbuilder did not have the opportunity to negotiate warranty extensions with suppliers.

In addition, commercial ship buyers and the Coast Guard have received improvements and corrections to ships during construction as the result of defects found on previous ships in the class—at the shipbuilder's expense. For example, representatives from a commercial company told us about a defect in the anchor of a ship that required a design change. The shipbuilder made the changes to the ship, at its own expense, during the warranty period and also absorbed the costs associated with changing the design and fixing other ships already in construction. The Coast Guard's FRC warranty fosters quality performance by encouraging the shipbuilder to address class-wide issues efficiently through the construction process. For example, according to FRC program officials, when a quality problem is identified on a particular ship that impacts the entire class of FRC ships, the shipbuilder corrects the problem and works with the Coast Guard to back fit and forward fit other ships in the class at the builder's expense to avoid a potential warranty claim regarding the problem in the future. Using its guaranty with a fixed-price incentive contract, the Navy would likely pay for all costs associated with such a change.

Warranty Engineers Advocate for Ship Buyers, not Shipbuilders

A final difference between commercial and Coast Guard ship buyers and the Navy is the use of a warranty engineer that represents the interests of the ship buyer. According to several commercial ship buyers we spoke with, the ship buyer's warranty engineer identifies defects by reviewing failures that occurred on the ship, identifying them as a warranty issue, and submitting a warranty claim to the shipbuilder. The warranty engineer also ensures that the work is completed to the ship buyer's satisfaction. One commercial ship buyer stated that, in theory, the most experienced and "crankiest" senior engineer in the fleet best suits the purpose of the warranty engineer. The Coast Guard's warranty engineer performs similar functions on the FRC.

In contrast, the Navy generally pays the shipbuilder to supply a guaranty engineer whose roles and responsibilities vary among the ships we reviewed. Navy program and contracting officials, for the ships we reviewed, stated that the shipbuilder's guaranty engineer provides valuable services ranging from mentoring new ship crews to scheduling the remaining work that needs to be completed on the vessel. However, because the guaranty engineer works for the shipbuilder, he or she does not identify defects. Rather, the guaranty engineer works with the ship's crew to primarily support the Navy in troubleshooting the issue and scheduling necessary corrective actions.

These comparisons highlight differences between the Coast Guard (in the case of the FRC) and commercial buyers' warranty practices versus the Navy's guaranty practices.

Objective of the Guaranty Is Unclear and Navy Has Not Fully Considered the Costs and Benefits of Using a Warranty per DOD Guidance

The Navy's guaranty lacks a clear objective, with insufficient guidance on when or how to use a guaranty. Without a clear objective, Navy contracting officials cannot properly implement the guaranty or assess its effectiveness. While use of a warranty per the FAR is not mandatory, the Navy has not examined whether or not a warranty is appropriate for the ships it purchases—a practice recommended in DOD guidance. Further, we found that the Navy's data regarding ship deficiencies is not sufficient to estimate the total expected shipbuilder-responsible defects on its ships—critical for understanding what the benefits of a warranty could be. In contrast, the Coast Guard's FRC program warranty is based on FAR principles. The FAR provides that: (1) the agency assesses whether or not a warranty is worth the cost, (2) the government may direct the contractor to repair or replace defective items at the contractor's expense, and (3) a principal purpose of a warranty in a government contract is to foster quality performance.

Unclear Objective and Sparse Guidance Make It Difficult to Assess Whether Low Guaranty Liability Limits Are Effective

The Navy does not have a clear objective for using its guaranty, which makes it difficult for Navy contracting and program officials to implement the guaranty effectively. According to *Standards for Internal Control in the Federal Government*, government programs require objectives and guidance to ensure that a program is achieving the desired outcomes in a manner that effectively uses funding.[14] Navy program officials provided various responses to us regarding the objective of the guaranty. For example, officials from several Navy program offices acknowledged that the guaranty clause is not a tool to improve ship quality. Rather, they noted that the guaranty clause helped expedite the procurement of needed parts after delivery by establishing a contractual relationship with the shipbuilder for all services and parts associated with the construction of the ship, as opposed to purchasing these items individually through other means. Because the guaranty is included in the construction contract, the guaranty clause allows the government to purchase parts

[14]GAO, *Standards for Internal Control in the Federal Government,* GAO/AIMD-00-21.3.1 (Washington, D.C.: November 1999).

and labor in the same manner and pricing as for ship construction. Other Navy program officials stated that the guaranty is useful because it involves purchasing the services of an experienced guaranty engineer, who helps schedule work that needs to be done and to mentor the ship's crew—usually comprised of junior officers who are new to the ship at the time the ship is delivered. While these services can provide meaningful benefits, it is unclear whether or not the guaranty is the appropriate and most cost effective mechanism to accomplish these tasks, and the Navy has not assessed whether or not this is the case.

Further, the Navy lacks sufficient instruction and data to guide contracting officers on how to correctly implement the guaranty to achieve an intended result. A senior Navy contracting official provided us with the available guidance for guarantees, which primarily consists of standard contract language used to establish a guaranty in ship contracts. The Naval Sea Systems Command Handbook also provides some instruction on how to execute the guaranty after a ship is delivered, but there is little guidance that focuses on specific contract terms to help contracting officers develop an effective guaranty. Navy contracting officials confirmed that they have historically used the existing guaranty on all ship purchases dating back 50 years without assessing the use of a warranty or whether or not the guaranty is effective. A senior Navy contracting official provided us with an assessment from 1980, but this assessment did not include any analysis about how the Navy's guaranty provision compared to alternatives.

In addition, without sufficient guidance, Navy contract officials have at times confused the guaranty with a FAR-based warranty. For example, in a recent contract memo, Navy contracting officials documented that a DDG 51 class vessel had a warranty based upon the FAR. Instead, this ship actually had a typical Navy guaranty, which is not based on the FAR, exemplifying that these officials did not have a clear understanding of the objective and process associated with the Navy's guaranty provision. Moreover, according to internal control standards, government programs are required to provide guidance that instructs program managers about how to best accomplish the program's objective that incorporates lessons learned from experience over time.[15]

[15]GAO, *Standards for Internal Control in the Federal Government,* GAO/AIMD-00-21.3.1 (Washington, D.C.: November 1999).

Further, the Navy cannot measure the effectiveness of the guaranty mechanism because it lacks a clear objective. According to *Standards for Internal Control in the Federal Government*, measuring the effectiveness of a program is required to provide reasonable assurance that the program will achieve its designated objective and that these objectives align with the organization's overall goals. For example, it is difficult to determine if the Navy's practice of establishing low limitations of contractor's liability for the correction of defects has a negative effect because the Navy's objective for the guaranty is not clear. The Navy's standard clause on limitation of liability states that the shipbuilder's limitation of liability should be set at two percent of the target construction cost of the ship or an amount to be determined by the program. However, for the programs we reviewed, the Navy sets the limitation of liability significantly below the level suggested in its guidance. As noted, the limitation of liability for LPD 25 was initially set at $1 million—equal to 0.08 percent of the target price of the ship.

Navy contracting officials told us that they keep the limitation of liability low because it allows the Navy to pursue other, less expensive contracting arrangements to fix the deficiencies, while at the same time extending the contractual relationship with the shipbuilder after delivery to provide for an expedited method for fixing any issues that arise shortly after delivery. If, on the other hand, as Navy contracting officials stated, the guaranty is meant to address shipbuilder-responsible deficiencies after delivery—while the guaranty period is still in effect—then a low limitation of liability is counter to this objective. Without a clear objective backed by instructive guidance, the Navy is not well-positioned to measure the effectiveness of the guaranty and then make improvements to it if necessary.

FRC Warranty Adheres to Federal Acquisition Regulation While Navy Has Not Considered Using a Warranty

The FRC's warranty is based on principles set forth in the FAR that discuss the objective and effective implementation of a warranty. While the FAR asks agencies to consider the use of a warranty, it notes that the use of a warranty is not mandatory. The FRC's warranty also adheres to Department of Homeland Security guidance regarding warranties, which implements the FAR provision on warranties.[16] If an agency chooses to use a warranty, the FAR discusses principles for effectively using them to

[16]The Coast Guard became part of the Department of Homeland Security in 2003.

better ensure that the government derives benefits. In contrast, there is no FAR provision that pertains to the Navy's guaranty, as it is an agency-specific contracting mechanism. Table 4 highlights the FAR principles compared with the Coast Guard's warranty on the FRC and the degree to which the Navy's guaranty mechanism demonstrated similar principles.

Table 4: How the Coast Guard Warranty and Navy Guaranty Compare with Federal Acquisition Regulation Principles

FAR principle	Coast Guard Warranty on Fast Response Cutter (FRC)	Navy Guaranty
1. The benefits derived from a warranty must be commensurate with the cost of the warranty to the government.	By comparing the FRC with warranty costs on another similar ship class, the Coast Guard determined that a warranty would provide significant value. According to the FRC program, the Coast Guard plans to spend approximately $35 million for warranties on 58 ships and receive an estimated $60 million in repairs. As of July 2015, the Coast Guard is currently on pace to receive more than $60 million in benefits based upon actual warranty claims for the first 13 FRCs. If the Navy used a warranty and could achieve similar results, the Navy could save millions in taxpayer dollars for planned ships.	The Navy does not have a process in place or accurate information to evaluate whether a warranty would be appropriate for ship acquisitions. Further, the Navy has not assessed the costs and benefits of using the guaranty compared to other mechanisms.
2. Normally, a warranty shall provide that the government direct the contractor to repair or replace defective items at the contractor's expense.	The Coast Guard's FRC warranty requires the shipbuilder to correct defects at no increase in the contract price.	While the Navy contracts with the shipbuilder to correct deficiencies, the Navy has paid for the vast majority of these corrections for the ships in our review.
3. One objective of a warranty is to foster quality performance.	The Coast Guard's FRC warranty fosters quality performance by encouraging the shipbuilder to correct class-wide issues. For example, according to FRC program officials, when a quality problem is identified on a particular ship that impacts the entire class of FRCs, the shipbuilder corrects the problem and works with the Coast Guard to back fit and forward fit other ships in the class to avoid potential warranty claims associated with the problem in the future.	The guaranty does not foster quality performance as, when in use, the government pays the contractor to construct the ship and then pays the contractor again when deficiencies occur. This makes sense if the resulting contract price is less expensive than the value of a warranty. However, the Navy has no data comparing ships with warranties to ships without warranties.

Source: GAO analysis of Navy and Coast Guard documentation and Federal Acquisition Regulation. I GAO-16-71

The Department of Defense created a warranty guide in September 2009 that expands upon the principles in the FAR. For example, the guide requires documentation, in a warranty plan, of why a warranty is, or is not,

appropriate for an acquisition.[17] While not required to use a warranty, the Navy neither considers using a warranty for large ship programs nor documents how it came to the decision not to use one. According to Navy contracting officials, the Navy does not know how a shipbuilder would price a warranty and, ultimately, what the Navy would have to pay in comparison to its current guaranty structure. Moreover, the Navy cannot assess the potential benefits since it does not have a full understanding of the total amount of shipbuilder-responsible deficiencies on its ships after delivery. For example, we reviewed deficiency data documented by the ships' crews after delivery and found that these data rarely differentiate between shipbuilder and government-responsible defects and often do not include the estimated cost to correct defects. By contrast, the Coast Guard documents each deficiency, the date the shipbuilder fixed the issue, the estimated cost of the issue, and any warranty extensions that apply. Navy contracting officials stated that shipbuilding is radically different from most Department of Defense acquisitions, in part because of the limited shipbuilding industrial base which they believe makes a warranty not cost effective for its ships. While using the warranty mechanism in a non-competitive ship purchase will likely require some customization and analysis, without assessing the value of using a warranty, the Navy cannot make an informed decision about which mechanism best protects the government from paying for shipbuilder-responsible defects after ships are delivered.

Finally, Navy contracting officials did not think a warranty would work effectively with the fixed price incentive contracts typically used with the Navy's large, complex, and often sole-source shipbuilding programs. However, the Coast Guard is planning to use a warranty with a fixed-price incentive contract on its forthcoming Offshore Patrol Cutter—a ship of similar size and complexity as the Navy's LCS. In doing so, the Coast Guard plans to purchase the warranty as a separate firm-fixed price item in the construction contract, which should prevent the shipbuilder from earning profit for these corrections in accordance with the share line. According to Coast Guard program officials, the Offshore Patrol Cutter's planned warranty will function similar to the FRC's warranty. According to Coast Guard officials, using this warranty will ensure that the shipbuilder pays for shipbuilder-responsible defects even though the planned

[17]We reported on inefficiencies with mandatory use of a warranty and recommended changes to laws regarding warranty use in GAO, *Weapons Acquisition: Warranty Law Should be Repealed,* GAO/NSIAD-96-88 (Washington, D.C.: June 1996).

contract is a fixed-price incentive type contract. Further, structuring the warranty as a separate line item in the contract ensures that any profit earned by the contractor to construct the ship due to the share line will be completely separate from the warranty work.

Conclusions

Shipbuilding is a complex endeavor, and a certain amount of shipbuilder-responsible deficiencies can be expected after delivery. This is the case for the Navy and Coast Guard ships in our review and is also the case in the commercial shipbuilding industry. However, key differences exist in how these deficiencies are dealt with—specifically, whether the builder or the buyer pays for corrections. The value of a warranty or guaranty depends primarily on the government's diligence in discovering defects after delivery (and ensuring the contractor corrects the defects), and the type and terms of the contract.

Fixed-price incentive contract types used commonly in Navy shipbuilding, coupled with certain terms within the contract, result in the government paying to correct shipbuilder-responsible defects. Further, these contracting arrangements allowed the shipbuilder to earn profit from fixing deficiencies discovered after delivery. Partly because the guaranty is included in the target cost of the ship and part of the construction line item of the contract subject to the share line, the shipbuilder earns the same level of profit for correcting defects as it does for building the ship. In addition, this contracting strategy obscures the Navy's ability to track payments and defects associated with the guaranty because guaranty claims are not differentiated from other costs. Further, the award of follow-on, cost-reimbursement arrangements to correct remaining defects—under which the contractor also earns fee (profit)—creates an apparent disincentive for quality ship construction.

The Navy has no guidance that clearly explains the guaranty's objective and, further, little instruction to contracting officers on how to implement the guaranty. Without an objective and associated guidance, the Navy is not well-positioned to ensure the effectiveness of the guaranty and associated policies. For example, it cannot know whether its strategy of including a low limitation of liability is effective. Although the FAR provides for consideration of certain factors in determining whether a warranty is appropriate for an acquisition and DOD requires documentation of why a warranty is or is not appropriate, the Navy has not considered or documented whether or not a warranty would be appropriate for its ships. Navy officials have set forth reasons why their historical approach lowers the overall construction cost of the vessel and results in a better deal than

pricing a warranty. Their reasons could have merit. However, the Navy has no data on the full costs of correcting shipbuilder-responsible defects after delivery. Therefore, it is not positioned to know whether or not warranties would increase the price of its ships. Because the Navy has not historically used or considered warranties for its ships, it may be prematurely discounting their use as a mechanism to improve ship quality and cost. In this regard, there may be benefit in examining the practices of others, such as the Coast Guard, which has adopted a warranty approach for the FRC and plans to do so for its upcoming Offshore Patrol Cutter.

Recommendations for Executive Action

To improve the use of warranties and guarantees in Navy shipbuilding, we recommend that the Secretary of the Defense direct the Secretary of the Navy to take the following three actions:

1. In arrangements where the shipbuilder is paid to correct defects, structure contract terms such that shipbuilders do not earn profit for correcting construction deficiencies following delivery that are determined to be their responsibility.
2. Establish and document a clear objective for using a guaranty, and then create guidance for contracting officers that illustrates how to implement a guaranty that meets this objective. This guidance should describe how contracting officers should use aspects of the guaranty, including determining an appropriate limitation of liability, to achieve the objective and include considerations as to when a guaranty should be a separate contract line item.
3. For future ship construction contracts, determine whether or not a warranty as provided in the FAR, provides value and document the costs, benefits, and other factors used to make this decision. To inform this determination, the Navy should begin differentiating the government's and shipbuilder's responsibility for defects and track the costs to correct all defects after ship delivery.

Agency Comments and Our Evaluation

We provided a draft of our report to the Departments of Defense and Homeland Security for review and comment. In its written comments, which are reprinted in appendix II of this report, DOD partially concurred with all three of our recommendations, and stated the issues will be addressed in a study to be completed by September 2016. The Department of Homeland Security had no comments.

With regard to the first recommendation, DOD agreed that guaranty terms should be reviewed, but disagreed that shipbuilding contracts always

result in the shipbuilder earning profit to correct defects determined to be the shipbuilder's responsibility. The latter point is not in contention, as our report found that the extent to which the shipbuilder earns profit for shipbuilder-responsible defects depends upon the type and terms of each ship construction contract. Nevertheless, as noted in the report, we found that for the four fixed-price incentive contracts in our review, the government paid for almost all shipbuilder-responsible deficiencies found after delivery. In its response, DOD stated that its policy changes, if any, should avoid resulting in higher overall costs to the government due to shipbuilder pricing associated with correcting defects. We agree; as we have found, in the case of the Coast Guard's Fast Response Cutter and several private ship buyers discussed in this report, the use of a warranty did not increase the cost of the ship. For example, we found several ship buyers, in both government and private industry, that require extensive warranties when purchasing ships and often receive this coverage with little or no increase in cost. The Navy plans to conduct a study to further examine the details and determine what policy changes, if any, could be implemented to change the structure of non-cost reimbursable contracts. The Navy plans to coordinate its findings with DOD's Defense Procurement and Acquisition Policy and complete the study by September 30, 2016.

With regard to our second recommendation, DOD also agreed that the considerations underlying a decision to use a guaranty provision should be documented, and that formal policy guidance on implementing a guaranty would be helpful. DOD disagreed, however, that a single objective for using a guaranty would satisfy the needs of all potential shipbuilding programs. While we understand that each contract will require different warranty or guaranty contract structures and provisions, our recommendation was that the Navy define the basic purpose of its guaranty, which is currently lacking. As noted in the report, we found that different stakeholders within the Navy used the guaranty to accomplish differing and, at times, contradictory objectives. Without a clear, basic objective and associated guidance, the Navy is not well-positioned to establish provisions that ensure the effectiveness of the guaranty. The Navy plans to conduct a study to determine what policy, if any, and guidance changes are necessary to effectively implement warranty or guaranty provisions. Once again, the response states that the Navy will coordinate with DOD's Defense Procurement and Acquisition Policy and complete the study by September 30, 2016.

In its response to our third recommendation, DOD stated that the Navy's planned study in response to our second recommendation will also

consider whether policy changes would be beneficial. DOD noted, however, that the FAR already requires contracting officers to ensure that the benefits of using a warranty are commensurate with the costs and that the FAR prohibits warranties under cost-type contracts without authorization. We found no evidence during the course of our review that the Navy considers using a FAR-based warranty for its ship contracts. In addition, all of the ships in our review were fixed price-type contracts. DOD also disagreed with our finding that the Navy has not been tracking costs to correct deficiencies after delivery. As we state in the report, the Navy only tracks the costs of shipbuilder-responsible defects up to the limitation of liability, which is often set very low compared to the total number of defects. After the limitation of liability is reached, the cost to repair shipbuilder-responsible defects is not tracked.

A final observation is that, in its response, DOD used the terms “warranty” and “guaranty” interchangeably. As we have found, however, these two mechanisms are very different and none of the Navy ships in our review used a FAR-based warranty. As the Navy and DOD move forward with the planned study and with implementing any changes to policy or guidance, it will be important to make this distinction clear.

We are sending copies of this report to the Secretary of the Department of Defense, the Secretary of the Department of Homeland Security, the Secretary of the Navy, the Commandant of the Coast Guard, and appropriate congressional committees. In addition, the report is available on our 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 mackinm@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 IV.

Michele Mackin
Director, Acquisition and Sourcing Management

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The Honorable Jack Reed
Ranking Member
Committee on Armed Services
United States Senate

The Honorable Thad Cochran
Chairman
The Honorable Richard J. Durbin
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Ranking Member
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Committee on Appropriations
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The Honorable Duncan Hunter
Chairman
Subcommittee on Coast Guard and Maritime Transportation
Committee on Transportation and Infrastructure
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Appendix I: Objectives, Scope, and Methodology

This report assessed: (1) the extent to which the Navy and Coast Guard's guaranty or warranty mechanisms reduce the government's exposure to additional costs and improve the quality of basic ship construction, if any, as compared to commercial shipbuilding; and (2) the extent to which the Navy and Coast Guard use available acquisition regulation and guidance in implementing guarantees and warranties in shipbuilding programs.

Our methodology for both objectives included reviewing the Navy and Coast Guard's guaranty and warranty policies and procedures. To assess the implementation of these policies and procedures, we selected a non-generalizable case study analysis of six ships that encompassed the majority of all ship classes recently delivered to and accepted by the Navy and Coast Guard in the last five years. Although our sample is non-generalizable, the Navy told us that they use the same guaranty for each ship and, though there are variations in contract type that impact how the guaranty works, the guaranty mechanism that we reviewed is used for all ships. Most of the contracts for the ships we reviewed were also used to purchase other ships in the class. So while we focused on the six case studies, the contracts and guaranty clauses we reviewed covered more than 20 ships. The case studies were chosen to represent the majority of shipyards in the United States that build Navy vessels, including Austal USA in Mobile, Alabama; Bollinger Shipyards in Lockport, Louisiana; General Dynamics Bath Iron Works in Bath, Maine; Huntington Ingalls Industries Ingalls Shipbuilding in Pascagoula, Mississippi; and Marinette Marine Corporation in Marinette, Wisconsin. We chose to review ships that were purchased using fixed-price type and incentive-type contracts, since warranties and guarantees on cost-reimbursement type contracts reimburse the shipbuilder for deficiencies and these contracts are used for immature shipbuilding efforts and we wanted to look at the hull, mechanical, and electrical aspects of more mature ship construction efforts. We did not choose lead ships, since lead ships tend to be purchased using cost-reimbursement type contracts and usually have more and different quality issues than the rest of the class. As shown in table 5, the ships that met these criteria were the following: USS *Michael Murphy* (DDG 112) guided missile destroyer, USS *Somerset* (LPD 25) amphibious transport dock, USS *Fort Worth* (Littoral Combat Ship 3) and USS *Coronado* (Littoral Combat Ship 4). From the Coast Guard, we reviewed the following ships: USCGC *Hamilton* (National Security Cutter 4), and USCGC *Paul Clark* (Fast Response Cutter 6). Five of these ships

had guarantees while the FRC was the only ship with a warranty.[1] We also made observations about the FRC class of ships beyond just FRC 6.

Table 5: Navy and Coast Guard Ships and Associated Shipyards Included in This Review

Shipyard	Location	Ship class (Ship)
Austal USA (subcontractor to General Dynamics/Bath Iron Works)	Mobile, Alabama	Littoral Combat Ship (LCS 4)
General Dynamics/Bath Iron Works	Bath, Maine	Arleigh Burke Class Guided Missile Destroyers (DDG 112)
Bollinger Shipyards	Lockport, Louisiana	Fast Response Cutter (FRC 6)
Huntington Ingalls Industries Shipbuilding	Pascagoula, Mississippi	National Security Cutter (NSC 4)
Huntington Ingalls Industries Shipbuilding	Avondale, Louisiana	San Antonio Class Amphibious Transport Dock (LPD 25)
Marinette Marine Corporation (subcontractor to Lockheed Martin)	Marinette, Wisconsin	Littoral Combat Ship (LCS 3)

Source: GAO. | GAO-16-71

To identify the extent to which the Navy's guaranty mechanism reduces the government's exposure to additional costs resulting from defective workmanship or equipment, we analyzed the costs to repair deficiencies after delivery for the six Navy and Coast Guard case studies. To determine the amount paid by the Navy and the Coast Guard for the correction of deficiencies, we examined each ship's contract and calculated the amount paid in accordance with the contract. In the cases where the ships were built using fixed-price incentive contracts, we calculated the costs paid by the government in the following manner:

1. We determined the estimated construction cost of the ship at completion based upon the government's estimate at complete at the time the ship was delivered. Navy officials agreed that this is a reasonable estimation of what the ship will cost when the contract is officially closed out. The estimated construction cost at completion for LPD 25, LCS 3, LCS 4, and NSC 4 is the government's estimate of the cost of the ships at the time the ship is delivered to the

[1]For NSC 4, the contract includes the FAR-based clause on warranty of supplies of a complex nature and includes a warranty as a separate contract line item, however the contract also includes a limitation of contractor's liability for correction of defects clause based on the Navy's standard clause and warranty work is cost reimbursable under the NSC 4 contract. Given that the characteristics of the warranty function more like the Navy's guaranty, we refer to the NSC's mechanism as a guaranty, rather than a warranty.

government. The actual final cost is determined several years later when the contract is closed.

2. If the share line applied, which it did for LCS 3 and LPD 25, we calculated each estimate at completion on the applicable portion of the share line to determine how much the government paid (cost and profit) for the portion of the ship to which the share line applied (in both cases this was most of the construction effort of which the guaranty is a very small segment). The share line did not apply to LCS 4 because the contractor's limitation of liability for guaranty work was $0. In the case of NSC 4, the share line did not apply because the guaranty was on a non-construction line item that did not have a share line. Table 6 displays the share lines for LCS 3 and LPD 25. The share line applies to the guaranty work only until costs for guaranty work reach the limitation of contractor liability for correction of defects specified in each ship's contract.

Table 6: Littoral Combat Ship 3 and LPD 25 Share Lines

Littoral Combat Ship 3 ($100,000 limitation of liability)	LPD 25 ($1 million limitation of liability)
Under target cost by more than $10 million: government shares 30 percent and shipbuilder 70 percent of savings	Under target: government shares 45 percent and shipbuilder 55 percent of savings
Under target by $10 million or less: government 10 percent and shipbuilder 90 percent	Over target up to 103 percent of target cost, government responsible for 85 percent and shipbuilder 15 percent of cost growth
Over target: government responsible for 70 percent and shipbuilder 30 percent of cost growth	Over target up to 108 percent of target cost, government responsible for 70 percent and shipbuilder 30 percent of cost growth
Ceiling price equals 128.25 percent of target cost	Over target from 108 percent to ceiling: government responsible for 60 percent and shipbuilder 40 percent of cost growth
	Ceiling price equals 128 percent of target

Source: GAO summarization of Navy data. | GAO-16-71

Note: The costs incurred by the shipbuilder for LPD 25 exceeded the ceiling price for the ship. However, the point of total assumption (where cost overrun sharing ends and the contractor assumes all cost overrun risk) was more than the ceiling price so the shipbuilder still earned about 3 percent profit when the costs incurred by the builder exceeded ceiling. Based upon the estimate at completion at delivery, the shipbuilder earned a small amount of profit on the whole ship, including the costs the shipbuilder had to pay once the ceiling was reached. Like the other contracts, we applied the profit earned on the portion of the ship to which the share line applied to the guaranty work in order to determine the costs paid by the government to correct contractor-responsible defects.

3. For the whole portion of the contract to which the share line applied, we calculated the added or reduced profit based upon the share line and the cost performance of the shipbuilder.

4. We then applied the cost performance of the shipbuilder under the share line to each portion of ship construction equally. For example, if a shipbuilder earned 10 percent profit on the portion of the ship

construction to which the share line applied, we applied this profit percentage to the guaranty work.

5. We then combined what the government paid to correct defects per the share line with the amount, if tracked, of shipbuilder-responsible deficiencies the government paid for using other means such as post-delivery cost-reimbursement type arrangements.

To understand the effect of the warranty or guaranty on ship quality, we reviewed documentation of defects after delivery, including trial cards, current ship maintenance project documentation, and data collected by shipbuilders. As reported, we found that these data were not reliable for our purposes of understanding the total amount the government paid to correct all shipbuilder-responsible defects. For example, the data did not contain cost information for all defects and did not identify whether or not the shipbuilder or the government was responsible for each defect. We also compared ships with guarantees to ships with warranties used in government and commercial shipbuilding programs to determine the extent to which each mechanism improves ship quality. We supplemented our information by interviewing Navy and Coast Guard program and contracting officials, as well as by visiting three U.S. private shipyards that build Navy and Coast Guard ships and spoke with shipyard representatives regarding these case studies. We also met with officials from several Navy offices responsible for building and delivering ships, including various Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP) commands; Navy Sea Systems Command Contracting and Logistics directorates. We also met with officials from Navy and Coast Guard offices, such as the Program Executive Offices, and Coast Guard's Project Residence Offices to gain a full understanding of the execution of a warranty and guaranty.

To assess the extent to which the Navy and Coast Guard use available acquisition regulation and guidance in implementing warranties and guarantees, we reviewed and analyzed the ship construction contracts for each of the six case studies. We reviewed available guidance related to warranties and guarantees, including the FAR, the Department of Defense Warranty Guide, the SUPSHIP Operations Manual, and the Naval Sea Systems Command Contracts Directorate Book of Standard Component Clauses. We also reviewed federal standards for internal control related to designing control activities, and assessed cost

estimating best practices guidance.[2] Based on the available guidance, we developed a list of the principles and their objectives regarding the use of warranties and compared how these were implemented for the six case studies we reviewed. In addition, we participated in the government's acceptance of FRC 13 from the shipbuilder (also known as ship delivery) in July 2015, which provided us with a better understanding of how the Coast Guard executes its warranty.

Our methodology also included learning about key practices used by leading commercial ship buyer regarding the structure and implementation of warranties for newly constructed vessels. We compared the execution of the guaranty or warranty of our government ship case studies to the execution of warranties on commercial ships of similar size and construction complexity. Our comparisons with commercial shipbuilding focused on basic ship construction because the work is similar to hull, mechanical and electrical work completed on Navy and Coast Guard ships. To do so, we interviewed leading ship buyers from the cruise, oil and gas, and commercial shipping industries some of which also provided us with supporting documentation, such as contract clauses. For the purposes of this review, the leading commercial ship buyers we spoke with included a number of companies that we identified in our previous work as leaders in their industry in terms of being large operators of cruise ships, oil and gas vessels, or containerships, and that agreed to participate in our review, including: Carnival Corporation and Royal Caribbean Cruises, Ltd.; Chevron Inc; and A.P. Moller-Maersk A/S, respectively.

We conducted this performance audit from December 2014 to March 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence 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.

[2] GAO/AIMD-00-21.3.1 and GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: March 2009).

Appendix II: Comments from the Department of Defense

THE ASSISTANT SECRETARY OF DEFENSE
3015 DEFENSE PENTAGON
WASHINGTON, DC 20301-3015

ACQUISITION

FEB 9 2016

Ms. Michele Mackin
Director, Acquisition and Sourcing Management
U.S. Government Accountability Office
441 G Street NW
Washington DC 20548

Dear Ms. Mackin:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-16-71, 'NAVY AND COAST GUARD SHIPBUILDING: Navy Should Reconsider Approach to Warranties for Correcting Construction Defects,' dated December 3, 2015 (GAO Code 121256). The Department acknowledges receipt of the draft report.

As more fully explained in the enclosure, the Department partially concurs with all three recommendations.

The Department appreciates the opportunity to comment on the draft report. For further questions concerning this report, please contact Dr. James Moreland Jr., Deputy Director for Naval Warfare, 703-614-3170 or james.d.moreland18.civ@mail.mil.

Sincerely,

Darlene Costello

Darlene Costello
Acting Assistant Secretary of
Defense for Acquisition

Enclosure:
As stated

GAO DRAFT REPORT DATED DECEMBER 3, 2015
GAO-16-71 (GAO CODE 121256)

"NAVY AND COAST GUARD SHIPBUILDING: NAVY SHOULD RECONSIDER APPROACH TO WARRANTIES FOR CORRECTING CONSTRUCTION DEFECTS"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATIONS

RECOMMENDATION 1: To improve the use of warranties and guarantees in Navy shipbuilding, we recommend that the Secretary of the Defense direct the Secretary of the Navy to take the following actions. In arrangements where the shipbuilder is paid to correct defects, structure contract terms such that shipbuilders do not earn profit for correcting construction deficiencies following delivery that are determined to be their responsibility.

DoD RESPONSE: Partially Concur. The Department agrees that contract terms should be reviewed. The Department disagrees, however, that shipbuilding contracts always result in payment of profit for correction of defects judged as shipbuilder responsibility. The Department requires flexibility in determining the most cost-effective strategy for post-delivery correction of defects. The Navy will conduct a study to examine the details and determine policy changes, if any, that could be implemented to structure future non-cost reimbursable shipbuilding contract terms. These policy changes, if any, will focus on the case where profit is no longer paid for correction of shipbuilder responsible defects, while avoiding price structures that would result in higher overall costs to the Government due to the shipbuilder pricing associated with correcting defects discovered after delivery. The Navy will coordinate its findings, conclusions and actions with the Office of the Secretary of Defense, Defense Procurement and Acquisition Policy and complete the study by September 30, 2016. For reference purposes this recommendation will be identified as GAO-16-071-01.

RECOMMENDATION 2: To improve the use of warranties and guarantees in Navy shipbuilding, we recommend that the Secretary of the Defense direct the Secretary of the Navy to take the following action. Establish and document a clear objective for using a guaranty, and then create guidance for contracting officers that illustrates how to implement a guaranty that meets this objective. This guidance should describe how contracting officers should use aspects of the guaranty, including determining an appropriate limitation of liability, to achieve the objective and include considerations as to when a guaranty should be a separate contract line item.

DoD RESPONSE: Partially concur. The Department agrees that the considerations used by a shipbuilding program and contracting offices to establish, quantify, and structure warranty and guaranty provisions in a shipbuilding contract should be documented and discoverable for review, and that formal written policy guidance would be helpful. The Department disagrees, however, with the premise that all of the considerations can be assembled into a single objective for using a guaranty that would satisfy every potential shipbuilding program's need for warranty

1

or guaranty provisions, including the appropriate limitation of liability and the appropriate contract structure to be implemented. The Navy will conduct a study to determine what policy, if any, and guidance changes are necessary to provide guidance on the many factors that should be considered to effectively implement warranty or guaranty provisions in a shipbuilding contract, as well as the appropriate manner by which to document the rationale used. The Navy will coordinate its findings, conclusions and actions with the Office of the Secretary of Defense, Defense Procurement and Acquisition Policy and complete the study by September 30, 2016. For reference purposes this recommendation will be identified as GAO-16-071-02.

RECOMMENDATION 3: To improve the use of warranties and guarantees in Navy shipbuilding, we recommend that the Secretary of the Defense direct the Secretary of the Navy to take the following action. For future ship construction contracts, determine whether or not a warranty as provided in the FAR, provides value and document the costs, benefits, and other factors used to make this decision. To inform this determination, the Navy should begin differentiating the Government's and shipbuilder's responsibility for defects and track the costs to correct all defects after ship delivery.

DoD RESPONSE: Partially concur. The Department agrees to consider, via the study agreed-to in Recommendation 2, whether policy changes regarding the use of warranty or guaranty provisions in future shipbuilding contracts would be beneficial. However, the Department notes that the FAR does require contracting officers ensure that the benefits of using a warranty are commensurate with the cost of warranties, and also prohibits warranties under cost-type contracts without authorization. The Department disagrees that the Navy has not been tracking costs. The Navy has been differentiating the Government's and shipbuilder's responsibility for defects and tracking the costs to correct all defects after delivery on shipbuilding contracts. Guaranty discrepancies (disagreements regarding responsibility for correcting the defects) are reported by the ship's force to the U.S. Navy Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP) (contract administration office) and the administrative contracting officer determines responsibility under the terms of the Guaranty clause of the contract, subject to the Disputes clauses. The costs for any shipbuilder responsible corrections are tracked by the SUPSHIP and the shipbuilding program office. For reference purposes this recommendation will be identified as GAO-16-071-03.

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Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Michele Mackin, (202) 512-4841 or mackinm@gao.gov

Staff Acknowledgments

In addition the contact name above, the following staff members made key contributions to this report: Diana Moldafsky, Assistant Director; Laurier Fish; Joseph Franzwa; Ronald Freeman; Laura Greifner; Kristine Hassinger; Marie Suding; Roxanna Sun; and Abby Volk.

Related GAO Products

National Security Cutter: Enhanced Oversight Needed to Ensure Problems are Discovered during Testing and Operations are Addressed. GAO-16-148. Washington, D.C.: Jan. 12, 2016.

Littoral Combat Ship: Navy Complied with Regulations in Accepting Two Lead Ships, but Quality Problems Persisted after Delivery. GAO-14-827. Washington, D.C.: Sept. 25, 2014.

Coast Guard Acquisitions: Better Information on Performance and Funding Needed to Address Shortfalls. GAO-14-450. Washington, D.C.: June 05, 2014.

Navy Shipbuilding: Opportunities Exist to Improve Practices Affecting Quality. GAO-14-122. Washington, D.C.: Nov. 19, 2013.

Best Practices: High Levels of Knowledge at Key Points Differentiate Commercial Shipbuilding from Navy Shipbuilding. GAO-09-322. Washington, D.C.: May 13, 2009.

Weapons Acquisition: Warranty Law Should Be Repealed. NSIAD-96-88. Washington, D.C.: June 28, 1996.

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