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# U.S. Government Accountability Office

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## Navy Shipbuilding: Increasing Focus on Sustainment Early in the Acquisition Process Could Save Billions

**GAO-20-2**

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Diana Moldafsky, Assistant Director

Government Accountability Office

Laurier Fish, Senior Analyst

Government Accountability Office

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## Key Objectives

In March 2020, we issued a report, which looked at the extent to which:

1. Navy shipbuilding programs deliver ships to the fleet that can be sustained as planned;
2. the Navy develops and uses key sustainment requirements during the acquisition process;
3. Navy shipbuilding programs effectively identify and evaluate sustainment costs and risks in key acquisition documentation;
4. Navy and Congressional leadership have insight into and effectively consider programs' sustainment planning and outcomes;
5. Navy shipbuilding programs leverage product support managers during the ship acquisition process.

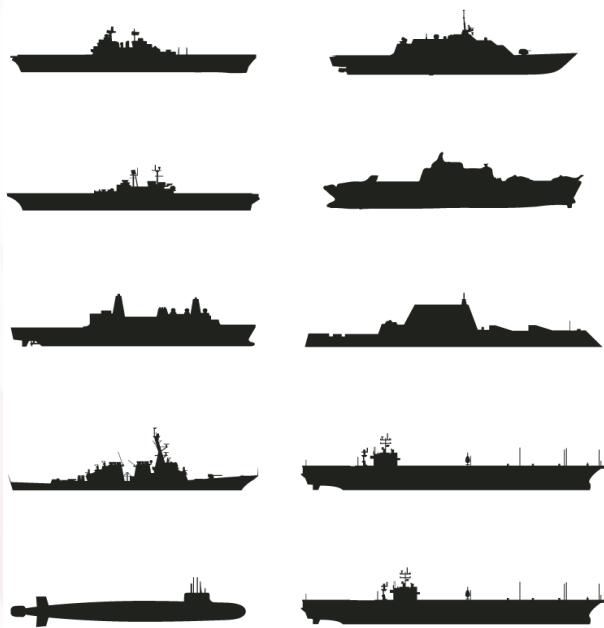
# Methodology in Brief

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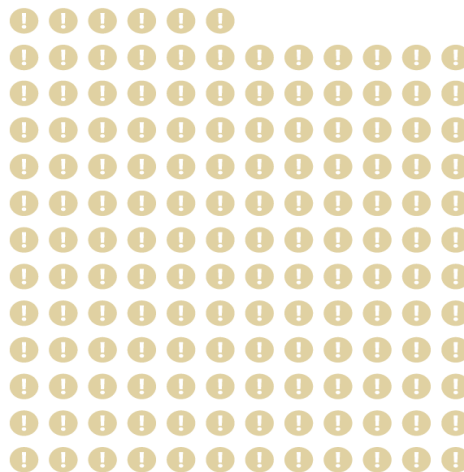
- We included all Navy warship classes that were under-construction or in-process during the last 10 years: CVN 77, CVN 78, LCS (both variants), DDG 51 FLT IIA and FLT III, DDG 1000, LPD 17 FLT I and II, SSN 774, SSBN 826, LHD 8, LHA 6, and FFG(X).
- We identified sustainment problems that spanned across multiple ships in a class. We excluded problems related to sailor error. We traced these problems back to decisions made during the acquisition process.
- We reviewed key Navy acquisition documents, including requirements documents, life-cycle cost estimates, life-cycle sustainment plans, and independent logistics assessment to determine the extent to which these documents addressed sustainment costs and risks.
- We met with over 100 Navy organizations and we reviewed thousands of Navy documents to fully understand the role of sustainment in the acquisition process for shipbuilding.

# Objective 1: Navy Spends Billions to Fix Sustainment Problems on New Ships

We identified 150 sustainment problems that affect multiple ships in a class that required more sustainment effort than planned. We were able to quantify the costs of a third of these issues—totaling over \$4 billion.



Number of Ship Classes<sup>a</sup>



Number of reported class-wide problems we reviewed that required more onerous maintenance than planned<sup>b</sup>

**150**



Approximate reported cost to remedy, mitigate, or absorb effects of about 30 percent of identified problems<sup>c</sup>

**Approximately \$4.2 billion**

Source: GAO analysis of Department of Defense and Navy documentation. | GAO-20-2

# Objective 1: Navy Spends Billions to Fix Sustainment Issues on New Ships

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- We found that the 150 sustainment problems generally fit into 3 categories:
  1. Problems maintaining commercial equipment (lack of spares parts, insufficient technical data, obsolescence, low reliability at sea).
    - Example: LCS engines, radars, waterjets, among others
  2. Design or contract specifications that did not factor in or specify operability and sustainability
    - Example: CVN 77 store elevators that are too small to fit standard pallets
  3. Untested sustainment assumptions that turned out to be incorrect once the ship was built and provided to the fleet.
    - Example: Virginia class ship service turbine generator

See GAO-20-2 for more information.

## Objective 2: Navy's Sustainment Requirements Do Not Inform Ship Reliability

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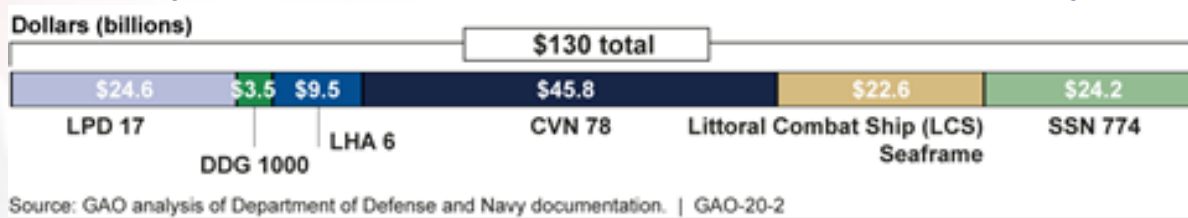
- Major shipbuilding programs (such as FFG(X) and DDG 51 Flight III) have key requirements that, if met, would result in warships that could not complete most deployments without severe mission-limiting casualties.

### Why?

- DOD and the Navy tie the Navy's definition of operational availability to the most severe category of casualty report (category 4), which are rarely used in operations. For example, we found two LCS-class deployments had 40 category 3 casualty reports and 0 category 4 casualty reports.
- FFG(X) key sustainment requirements would allow for category 4 casualty reports to occur over 25 percent of the time the ship is in operation. Such requirements cannot be used effectively in acquisition to improve reliability.

# Objective 3: Navy Did Not Evaluate Sustainment Costs and Risks in Major Acquisition Documentation

**Life-cycle Cost Estimates:** for six shipbuilding programs whose costs GAO could assess, the Navy had underestimated sustainment costs by \$130 billion



We found two key flaws in the Navy’s life-cycle cost estimates:

- Unproven assumptions about ship sustainment
- No risk and sensitivity analyses

**Life-cycle Sustainment Plan should:** (1) identify sustainment risks and (2) develop a business case for the sustainment approach. We found:

- Only 2 of 6 shipbuilding programs identified any sustainment risks.
- None of the Navy’s life-cycle sustainment plans had business cases.

## Objective 3: Navy Did Not Evaluate Sustainment Costs and Risks in Major Acquisition Documentation

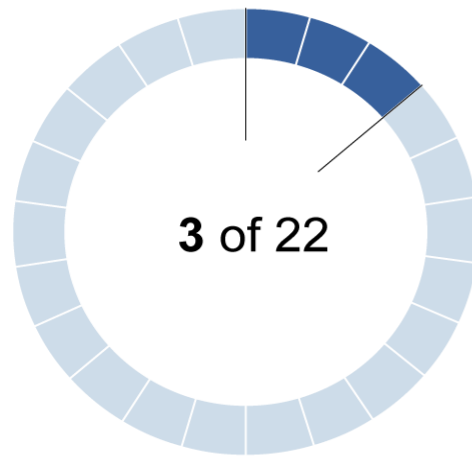
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- **Independent Logistics Assessment (ILA):** we found that assessments rarely identified sustainment risks (including risks that other Navy organizations had already identified). Two examples:
  - **Virginia-class submarines:** In 2014 to 2016, the Navy was already having significant trouble acquiring spare parts—including hundreds of parts with over 5-month lead time. However, a 2016 ILA found that supply support was low risk. a lack of parts continues to result in high rates of parts cannibalization.
  - **Ford-class carriers:** In 2013, Navy testers found that the Ford-class design may not have enough room for the needed crew. A 2016 ILA did not identify this risk, noting that extensive analysis was conducted to verify the number of crew. Prior to its first mission, CVN 78 is already over capacity with a full crew and air wing (which is 250 more sailors than initially planned).

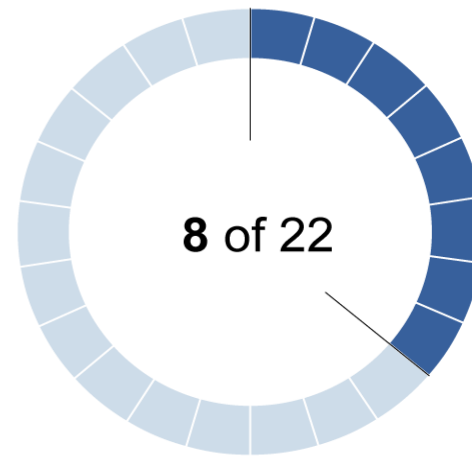


## Objective 4: Navy Leadership Does Not Ensure that Sustainment is Considered at Key Points in the Acquisition Process

- Navy guidance instructs senior Navy leadership (ASN RD&A and CNO) to consider sustainment at oversight (gate) meetings and approve key documents.



Life-cycle sustainment strategy/plan<sup>a</sup>



Operating and support cost drivers<sup>a</sup>

Source: GAO analysis of briefings and meeting minutes from Navy Gate reviews. | GAO-20-2

- While some oversight meetings later in the acquisition process discussed some aspect of sustainment, over 90 percent of the briefing content for these meetings did not discuss life-cycle costs, plans, or risks.

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## Objective 4: Navy Leadership Does Not Ensure that Sustainment is Considered at Key Points in the Acquisition Process

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- Several improvements currently under consideration: (1) implementing a sustainment program baseline and (2) adding a sustainment oversight meeting (gate). While positive steps, unlikely to result in sustainment considerations earlier in the acquisition process when ships are developed and built.
- Nunn-McCurdy statute (mechanism for Congressional oversight of major defense acquisition programs' unit cost growth) focused only on acquisition cost growth, not sustainment. However, we found many programs with over 50 percent annual O&S cost growth, which would have constituted a Nunn-McCurdy breach for acquisition costs.

## Objective 5: Product Support Managers have Limited Input into the Acquisition Process

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- Product Support Managers (PSMs) are senior leaders within shipbuilding programs that are tasked with developing a comprehensive support plan for Navy ships.
- We found two key factors that limit PSM influence:
  1. Navy policy does not require PSMs to be involved early in the acquisition process (pre-MS B). While Columbia-class program had a PSM prior to MS A, FFG(X) did not have a dedicated PSM as it approached MS B.
  2. PSM responsibilities are often at odds with the objectives of the program office: comprehensive product support vs. a greater emphasis on delivering ships on time and at the targeted acquisition cost.

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## 11 Recommendations and 1 Matter for Congressional Consideration

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- 5 recs. to address improvements to key ship requirements, including removing category 4 casualty reports from DOD's definition of ship operational availability
- 3 recs. to improve cost estimates, life-cycle sustainment plans, and independent logistics assessments
- 2 recs. to improve Navy leaderships' focus on sustainment considerations
- 1 rec. on changing Navy guidance to ensure that PSMs are involved from the very beginning of new acquisition programs
- 1 matter for Congress to consider adding a "Nunn-McCurdy-like" sustainment cost component



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## **Congressional Relations**

Katherine Siggerud, Managing Director, [siggerudk@gao.gov](mailto:siggerudk@gao.gov)  
(202) 512-4400, U.S. Government Accountability Office  
441 G Street, NW, Room 7125, Washington, DC 20548

## **Public Affairs**

Chuck Young, Managing Director, [youngc1@gao.gov](mailto:youngc1@gao.gov)  
(202) 512-4800, U.S. Government Accountability Office  
441 G Street, NW, Room 7149, Washington, DC 20548

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