U.S. Government Accountability Office

Navy Shipbuilding:

Past Performance Provides Valuable Lessons for Future Investments

Diana Moldafsky, Assistant Director, Government Accountability Office

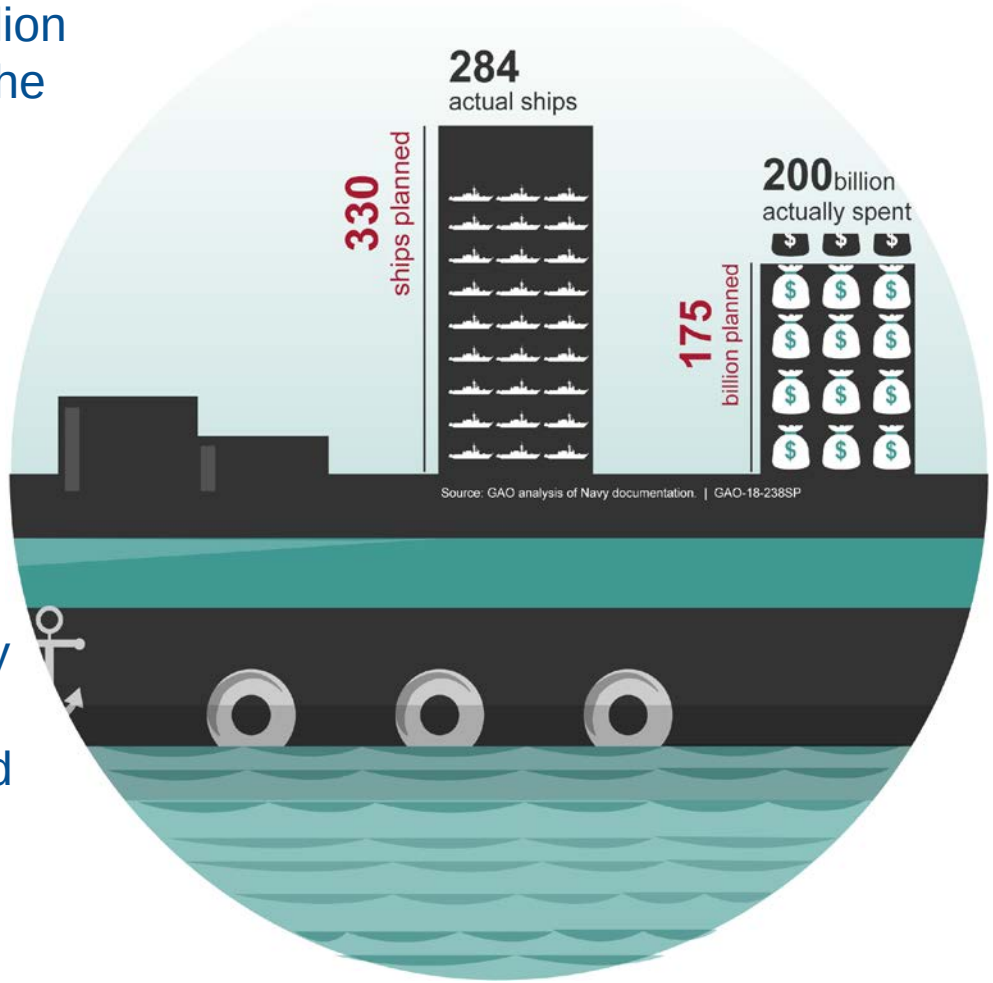
Overview – Key Points

In June 2018, we issued a report which provided an overview of our work on shipbuilding programs over the past decade:

- Navy shipbuilding programs have experienced cost overruns, schedule growth, and performance/quality deficiencies during the last 10 years (Outcomes)
- Private sector ship buyers and builders retire risk earlier in the acquisition process than the Navy (Best practices)
- Major program decisions (ship construction funding) are made absent key knowledge creating a risky acquisition environment
- The Navy uses a series of practices that enables shipbuilding programs to proceed through the acquisition process with significant risk (“Enablers”)

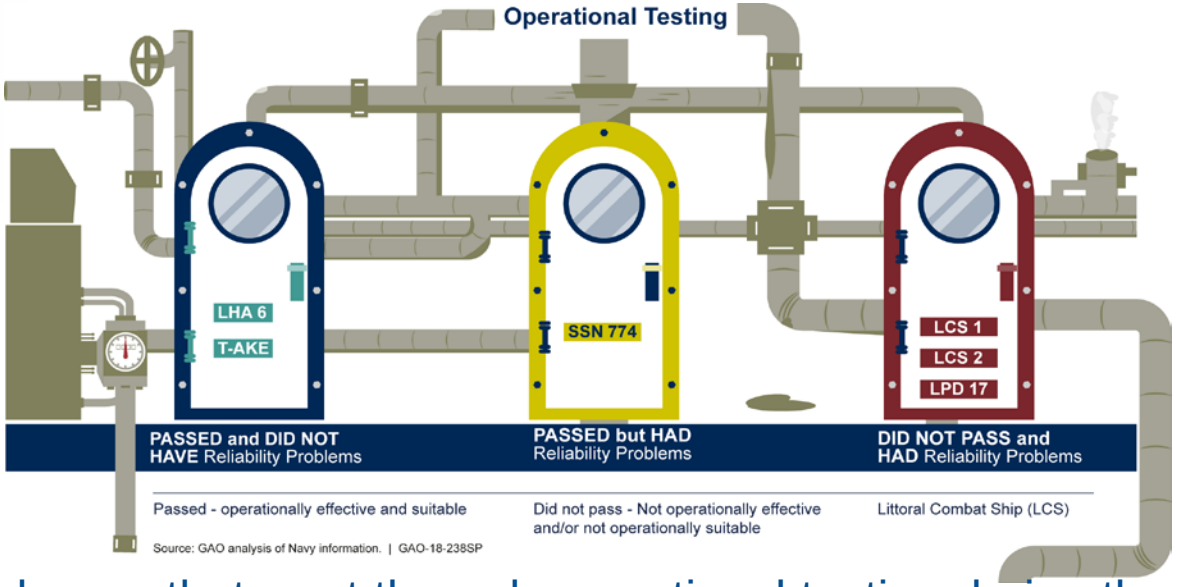
Outcomes – Cost and Schedule Expectations

- Overall, Navy lead ships cost a total of $8 billion more to construct than initially budgeted for the 11 most recently delivered lead ships.
- Schedule delays are common. For example, all 8 of the lead ships we have reviewed were provided to the fleet behind schedule, and more than half of these ships were delayed by more than 2 years.
- These challenges have resulted in a less-capable and smaller fleet today than the Navy planned over 10 years ago. Compared to these plans, as of spring 2018, it has received $25 billion more in funding but has 50 fewer ships in its inventory.



See GAO-18-238SP for more information.

Outcomes – Performance and Quality



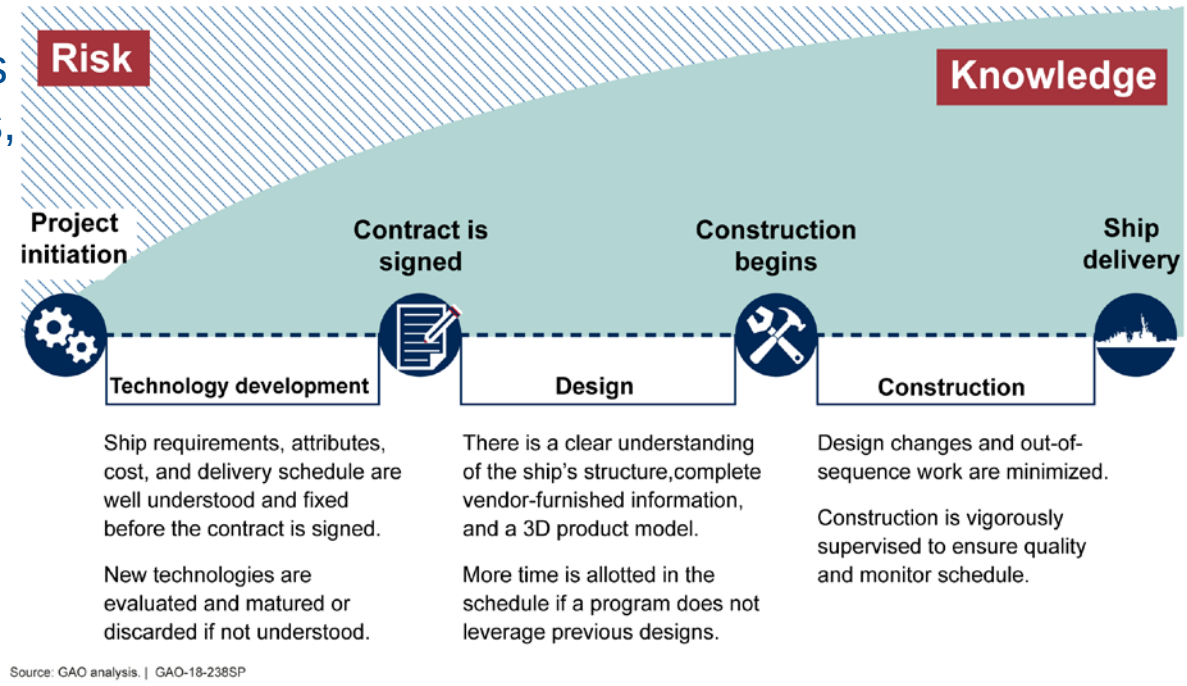
- Of the six ship classes that went through operational testing during the last 10 years, only half passed testing on the first attempt, meaning the ships were found to be operationally effective. Testing revealed that four of the six ship classes had significant reliability issues--meaning key pieces of equipment failed more frequently than desired.

- The Navy has accepted delivery of ships in an incomplete or deficient state and that several of these major deficiencies remained uncorrected when the ships were provided to the fleet.

See GAO-18-238SP for more information.

GAO-Identified Best Practices for Shipbuilding

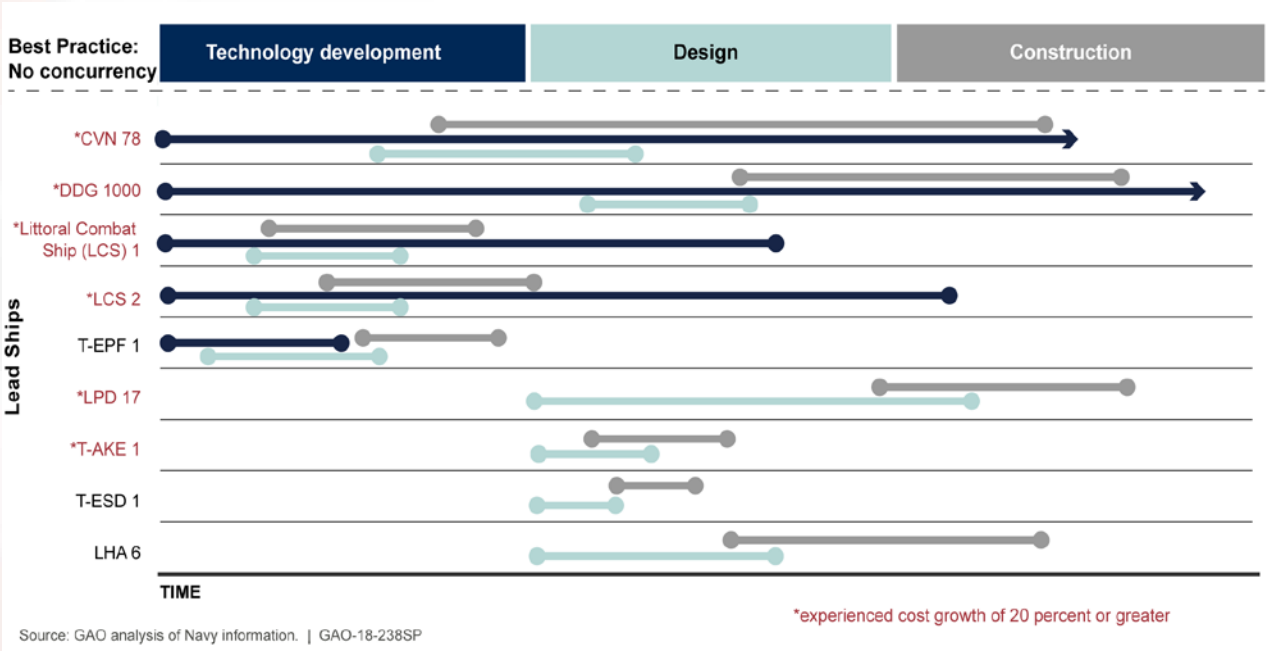
- In its simplest form, an acquisition business case should balance the concept selected to satisfy warfighter needs and the resources—technologies, design knowledge, funding, and time—needed to transform the concept into a product.
- In 2009, based on our analysis of several leading buyers and builders of large, complex commercial ships, we identified best practices that could be adapted by the Navy.
- Although there are differences between Navy and commercial shipbuilding—in particular, the Navy usually integrates weapons and advanced information systems into its ships—the attainment of knowledge is crucial to success in both endeavors.



Source: GAO analysis. | GAO-18-238SP

Related GAO reports: GAO-04-386SP, GAO-07-943T, and GAO-09-322.

Enablers – Taking on Risk



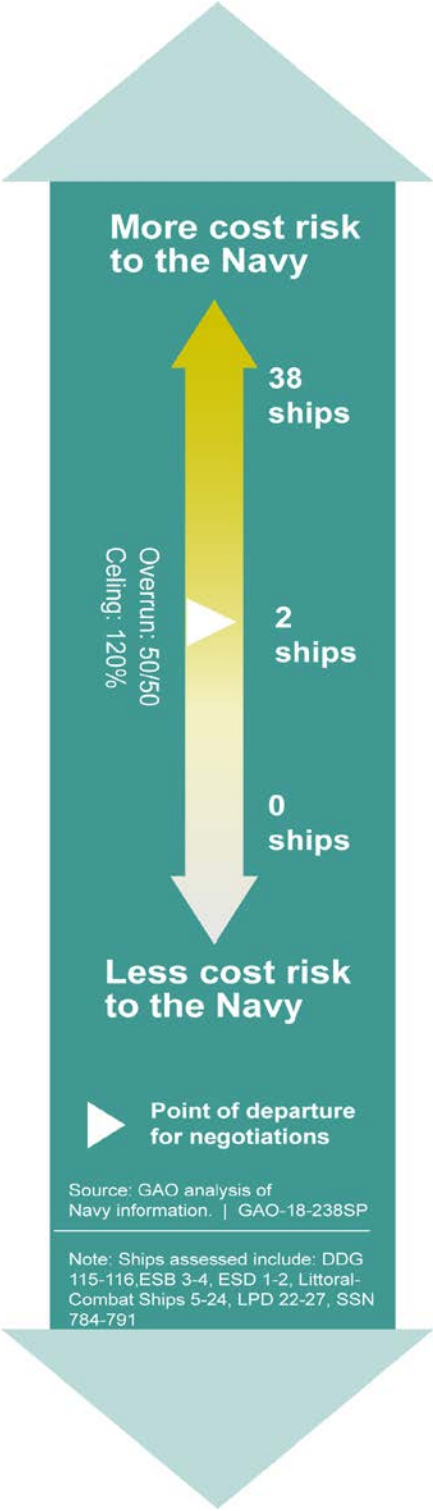
- Due to the dynamics of weapon system budgeting, the effort to secure funding for a shipbuilding program runs counter to the process of attaining sufficient knowledge. At the time the Navy requests funding from Congress to construct a new ship, essential elements of the business case are not yet fully understood.

Instead of gradually building knowledge over time and sequentially moving through the three main phases of the shipbuilding process in accordance with best practices, the Navy's shipbuilding programs experience significant overlap—known as concurrency—between the technology development, design, and construction phases of the acquisition.

Related GAO reports: GAO-07-943T, GAO-08-1061T, GAO-09-322, GAO-15-530, GAO-16-84T, GAO-16-356,GAO-16-613, and GAO-17-323.

Enablers – Risk Shifting

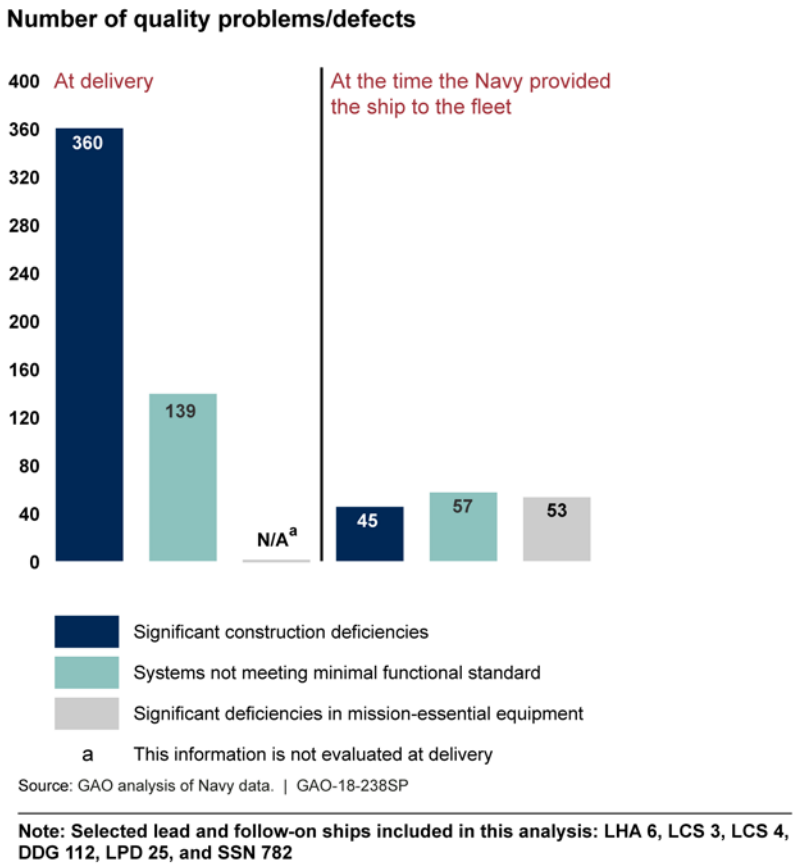
- To account for unresolved risks, we found that the Navy structured its fixed-price incentive contract elements to assume more responsibility for cost growth than DOD guidance recommends.
- When the structure of the contract elements results in the government bearing a greater amount of the cost risk, the effectiveness of the contract to motivate the shipbuilder to control costs is weakened.
- For example, we found that fixed-price incentive contracts awarded for follow-on ships in the LPD 17 and LCS classes contained unrealistic cost targets that did not accommodate the high degree of unresolved technical risks in the programs, resulting in the Navy paying the maximum costs (under the contract's price ceiling) for half of the delivered ships we reviewed.



See GAO-17-211 for more information.

Enablers – Risk Shifting

- The Navy's ship delivery policy, while providing that ships should be defect-free and mission-capable, lacks clarity regarding what constitutes a defect and by when defects should be corrected.
- This enables the Navy to accept delivery of ships sooner in an effort to reduce cost and schedule pressures when they tend to increase the most towards the end of ship construction.
- As a result, we have recommended in multiple reports that the Navy should clarify its ship delivery policy to define what constitutes a complete ship and by when this should be achieved.
- The Navy agreed that complete ships should be provided to the fleet but disagreed that its ship delivery policy is unclear and results in ships being provided to the fleet with outstanding deficiencies and quality challenges.



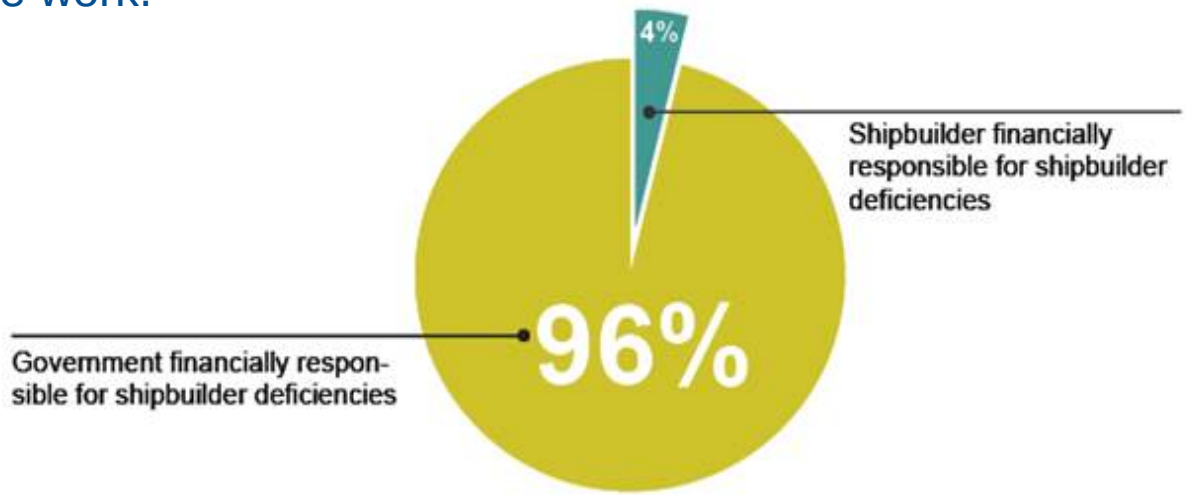
See GAO-18-238SP for more information.

Enablers – Risk Shifting

- We found that the Navy structures shipbuilding contracts so that it pays shipbuilders to build ships as part of the construction process and then pays the same shipbuilders a second time to repair the ship when construction defects are found.

- For example, on LPD 25, the ship's exterior hull paint began to peel shortly after delivery. The Navy determined that the shipbuilder had not adequately prepared the surface of the ship prior to applying a second coat of paint. The shipbuilder re-painted the vessel, but the Navy paid cost plus 10 percent profit for the work.

- Navy believes that its approach to correcting shipbuilder responsible defects reduces the overall cost of purchasing ships. However, the Navy has no analysis that proved this point.



Source: GAO analysis of Navy information. | GAO-16-238SP

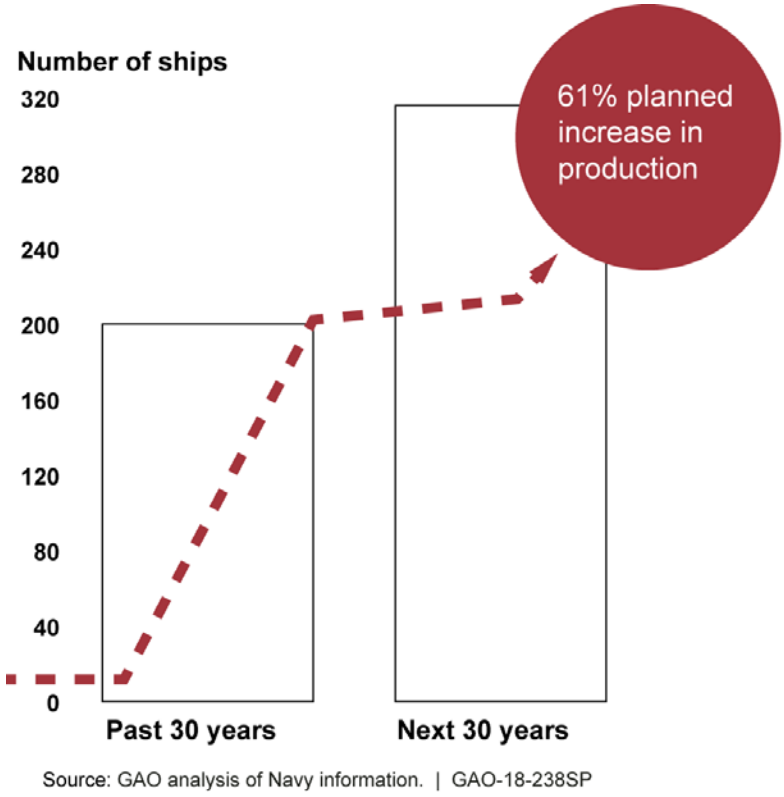
Related GAO reports: GAO-09-322, GAO-16-71, and GAO-17-211.

Conclusion

- The Navy's approach and the poor acquisition outcomes that followed have prevented it from purchasing ships in the quantities and with the capabilities it planned, and have put its long-range plans at risk.

- The Navy has taken some actions to improve knowledge and reduce risk prior to key milestones (eg. limiting technology development and increasing design stability.)

- It is particularly important that the Navy takes steps to improve the business cases of its new programs before starting construction because its ability to achieve a more modern and larger fleet relies on building new ship classes, such as the Columbia class submarine, a guided missile frigate, and a new large surface combatant.



Source: GAO analysis of Navy information. | GAO-18-238SP

- The key to overcoming the cycle of cost growth, schedule delays, and capability shortfalls in shipbuilding programs is for decision makers within the Department of Defense, the Navy, and Congress to demand that programs be supported by executable business cases.

See GAO-18-238SP for more information.